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The United States and Singapore: Indo-Pacific Partners

Edited by **Jeffrey Ordaniel** and **Ariel Stenek**

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Front cover image

Soldiers from the Singapore Armed Forces stand in formation during the opening ceremony for Exercise Valiant Mark 2018 at Marine Corps Air-Ground Combat Center Twentynine Palms, California, Aug. 27, 2018.

Source

U.S. Embassy Singapore Twitter
U.S. Marine Corps photo by LCpl. Rhita Daniel

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About this volume

Authors of this volume participated in the inaugural U.S.-Singapore Next-Generation Leaders Initiative, sponsored by the U.S. Department of State, through the U.S. Embassy Singapore. With backgrounds from academia, public policy, civil society and industry, the cohort brings rich insights on the past, present, and future of the U.S.-Singapore relationship. Between September 2020 and August 2021, cohort members engaged with senior experts and practitioners as they developed research papers addressing various aspects of the bilateral relationship.

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TABLE OF CONTENTS

1

Pragmatic and principled– U.S.-Singapore relations as a model partnership in the Indo-Pacific

Jeffrey Ordaniel & Collin Koh

Abstract

The U.S.-Singapore strategic partnership is often described as a model for the region. Indeed, for 55 years, the United States and Singapore have developed close economic links, strong military ties, and growing people-to-people trust. The tiny island city-state has been commonly labeled as the most steadfast American 'ally' in Southeast Asia, the absence of a formal mutual defense pact notwithstanding. But what underpins the vibrant and mutually beneficial U.S.-Singapore relations? Academic and policy literature mostly point to America's 'access' requirements in Southeast Asia, and Singapore's size constraints and location as mutually reinforcing determinants. Yet, a closer look at how the relationship has progressed over the past five decades would reveal that the partnership is more than just geography and convenience. It is 'pragmatic' –prioritizing functional cooperation consequential in fostering a favorable balance of power, and a more stable regional environment, over ideologies and 'noise' of day-to-day politics. And it is 'principled' –based on a shared belief in market capitalism, the rule of law, and a free, secure and open access to the global commons. This pragmatic and principled approach to the relationship has allowed both countries to effectively cooperate on geopolitical and security issues, forge closer economic ties that have promoted jobs and economic growth, and develop closer people-to-people ties that have resulted in increased mutual trust and confidence over the long term.

Introduction

The U.S.-Singapore strategic partnership is often described as a model for the region. Partnership is the new alliance, argues Asia Society's Matt Stumpf, describing America's success in building partnerships on the U.S.-Singapore model as a determinant of "whether U.S. engagement in Asia flourishes in the 21st century."[1] Indeed, for 55 years, the United States and Singapore have developed close economic links, strong military ties, and growing people-to-people trust. The close relationship has benefited not just the two countries, but also the region. Singapore and the United States have started leveraging each other's strengths and established cooperative mechanisms that address a multitude of regional and global challenges, from maritime safety and security to climate change and energy, and from cyber insecurity to poverty alleviation.

For Singapore, the United States continues to play "a role which nobody else can play, holding the ring and fostering the stability of the region, enabling other countries to grow and prosper in a stable environment."[2] For Washington, Singapore allows the United States to maintain "effective Pacific presence," provides an economic partnership that helps create American jobs, and offers "advice and good counsel" as it reinforces its Indo-Pacific strategy.[3]

But what underpins the vibrant and mutually beneficial U.S.-Singapore relations? Academic and policy literature mostly point to America's 'access' requirements in Southeast Asia, and Singapore's size constraints and location as mutually reinforcing determinants. Yet, a closer look at how the relationship has progressed over the past five decades would reveal that the partnership is more than just geography and convenience. It is 'pragmatic' –prioritizing functional cooperation consequential in fostering a favorable balance of power, and a more stable regional environment, over ideologies and 'noise' of day-to-day politics. And it is 'principled' –based on a shared belief in market capitalism, the rule of law, and a free, secure and open access to the global commons. This pragmatic and principled approach to the relationship has allowed both countries to effectively cooperate on geopolitical and security issues, forge closer economic ties that have promoted jobs and economic growth, and develop closer people-to-people ties that have resulted in increased mutual trust and confidence over the long term.

"...the partnership is more than just geography and convenience. It is 'pragmatic' –prioritizing functional cooperation consequential in fostering a favorable balance of power, and a more stable regional environment, over ideologies and 'noise' of day-to-day politics. And it is 'principled' –based on a shared belief in market capitalism, the rule of law, and a free, secure and open access to the global commons."

More than just geography: 55 Years of U.S.-Singapore Relations

U.S. relationship with Singapore is among the most "balanced" in terms of strategic underpinnings. The relationship does not rest on security, alone or just on commerce. This gives the partnership sustainability and endurance amidst the emerging challenges.

Economic Underpinnings

During its first decade as an independent republic, Singapore's most important economic lifeline was the United States. In the early days of the Vietnam War, the U.S. military established a procurement office in Singapore, which enabled the city-state to export millions of dollars worth of goods to South Vietnam. When the British vacated Singapore's shipyards and airbases in the late 1960s, which at that time were responsible for at least 16% of Singaporean GDP and the employment of 40,000 civilian laborers, the United States filled the void.[4] Vacated British naval bases were quickly commercialized and served to maintain U.S. vessels. Air facilities were also commercialized and taken over by American defense companies, Lockheed and Grumman, and served both U.S. and Singaporean militaries. This was a strategic decision. For the United States, the utilization of the vacated military facilities would prevent Soviet vessels from making use of them. For Singapore, although increasing U.S. security presence did not include an explicit commitment to defend the city-state, the economic benefits were substantial that helped accelerate Singapore's miraculous economic growth in the years and decades that followed.

The United States and Singapore started negotiating for a free trade agreement in December 2000, and an agreed draft was completed in November 2002. In late July 2003, the United States-Singapore Free Trade Agreement Implementation Act passed the U.S. House of Representatives by a vote of 272-155 and the U.S. Senate by 66-32. On September 4, 2003, President George W. Bush signed the U.S.-Singapore Free Trade Agreement into law, and the agreement came into force on January 1, 2004. This made Singapore America's first Asian FTA partner.

The economic impact has been substantial and benefited both Americans and Singaporeans. As discussed by James Guild in chapter 4, U.S. economic engagements have helped transform Singapore into a major financial hub. American firms used Singapore to expand to the region. The FTA accelerated U.S. foreign direct investments (FDI) into Singapore, as the deal provided American investors and companies with a level-playing field, and more options for engaging the Singaporean market and the broader ASEAN region. The United States has been Singapore's largest source of FDI for decades. More than 4,500 U.S. companies are operating in Singapore. Many took direct

[1] Stumpf, Matt. "Partnership Is the New Alliance: Why U.S.-Singapore Relations Should Be a Model for the U.S. in Asia," *Asia Society Blog*, December 1, 2014, https://asiasociety.org/blog/asia/partnership-new-alliance-why-us-singapore-relations-should-be-model-us-asia

[2] Tan, See Seng. "The United States: Still Singapore's Indispensable Partner?" *East-West Center*, Asia Pacific Bulletin, no. 295 (December 10, 2014), https://www.eastwestcenter.org/sites/default/files/private/apb295.pdf

[3] Stumpf, Matt "Partnership Is the New Alliance…"

[4] Chua, Daniel Wei Boon. *US-Singapore Relations, 1965 -1975: Strategic Non-alignment in the Cold War* (Singapore: NUS Press, 2017).

equity stakes in local corporations, started new companies to compete in the Singaporean market, and established subsidiaries or holding firms in the city to invest in other ASEAN markets.

The FTA also significantly increased trade volumes between the two countries. Singapore is now the United States' largest trading partner in Southeast Asia, with bilateral goods and services trade reaching US$93 billion. Data from the U.S. Department of Commerce show U.S. exports to Singapore provided jobs to over 200,000 Americans in 2020.[5]

Geopolitical and Security Underpinnings

Singapore's immediate strategic environment after independence in 1965 and today, has remained quite the same. A set of geostrategic and historical circumstances essentially shapes the tiny island city-state's diplomatic approaches. For its small geographical size, lack of strategic depth and lack of natural resources, Singapore needs to make cold calculations about the realities it finds itself confronted with. In particular, in the early formative years of newfound independence, the island found itself situated in a complex neighborhood that puts to test its national survival and future – larger, at times hostile Muslim-dominant neighbors to its north and south, a multi-racial (if ethnic Chinese-dominant) society exposed to the threat of communist subversion, not to mention the lack of wealth and overall national power.

Seen in this context, it is therefore not difficult to understand how Singapore situates its relationship with the United States within a broader context of its sense of insecurity. The superpower has always been regarded as the most benign and trustworthy of the great powers crucial in promoting peace and stability in a complicated regional strategic environment.[6] The tiny island city-state has been commonly labeled as the most steadfast American 'ally' in Southeast Asia, the absence of a formal mutual defense pact notwithstanding. In purely geostrategic terms, Singapore is important to U.S. regional and global interests because it is situated along the Malacca Strait, one of the most crucial waterways that serves as a vehicle of world economic well-being, and the location of which allows the projection of American military power into the Western Pacific and Indian Oceans.

Geostrategic imperatives aside, despite their different political systems, Singapore, and the United States do share common beliefs – in market capitalism, the need for stability, freedom of navigation in the global maritime commons, and perhaps most importantly of all, in the rule of law. These principles help underpin the security relations.

"Both countries also share a common strategic assessment that a weakened American presence would destabilize the region, and that China's rise constitutes an opportunity as well as a challenge."

Both countries also share a common strategic assessment that a weakened American presence would destabilize the region, and that China's rise constitutes both an opportunity as well as challenge.[7] Fundamentally, Singapore's U.S. policy is based on three key principles: 1) non-alignment, which was adopted since the Cold War until the present when engaging major powers; 2) mutual benefit with regard to their respective national interests; and 3) support for the American economic and strategic presence in Southeast Asia designed to provide a balance of power vis-à-vis the major powers in the region.[8]

Traditionally, because of geopolitical sensitivities in its immediate Southeast Asian neighborhood Singapore had labored quietly to facilitate U.S. presence in the region, often seeking to downplay its close strategic partnership with the United States out of concern of antagonizing Indonesia and Malaysia.[9] Notably, Changi Naval Base (RSS Singapura) was purpose-built to and recognized as one of the few facilities worldwide capable of accommodating an aircraft carrier (entirely at Singapore's cost).[10] Sembawang Wharves is where the Commander, Logistics Group Western Pacific (COMLOG WESTPAC) was headquartered and responsible for coordinating U.S. Indo-Pacific Command's (previously Pacific Command) military activities and furnishing logistical and administrative support. The U.S. Navy accounts for one-third of all foreign warship visits into Changi Naval Base and over two-thirds of all foreign warship calls into Sembawang Wharves.[11] Then there is Paya Lebar Air Base, which serves as a hub for U.S. military transit flights through the region, all guaranteed under the 1990 Memorandum of Understanding Regarding United States Use of Facilities in Singapore, and its 1998 Addendum.

In return for this invaluable support, the country benefits from privileged access to defense technology, including state-of-the-art F-16C/D and F-15SG multi-role fighter jets as well as precision-guided munitions and also entry as a Security Cooperative Participant (SCP) in the F-

[5] Office of the United States Trade Representative, "Singapore," Countries & Regions, https://ustr.gov/countries-regions/southeast-asia-pacific/singapore

[6] Center for Strategic & International Studies (CSIS). "U.S. Alliances and Emerging Partnerships in Southeast Asia: Out of the Shadows," A Report of the CSIS Southeast Asia Initiative (July 2009): 32. See Seng Tan, "America the Indispensable: Singapore's View of the United States' Engagement in the Asia-Pacific," *Asian Affairs: An American Review* 38, no. 3 (2011): 156-171. Lynn Kuok, "The U.S.-Singapore Partnership: A Critical Element of U.S. Engagement and Stability in the Asia-Pacific," Asian Alliances Working Paper Series, Paper 6 (Brookings Institute, July 13 2016): 1. Andrew T.H. Tan, "Singapore's Survival and Its China Challenge," *Security Challenges* 13, no. 2 (2017), Shifting Tides: 11-31.

[7] Tan, "America the Indispensable," 156. Alexander Sullivan, "Autonomous Power? Securing Singapore's Interests in the 21st Century," *Center for a New American Security,* Asia Strategy Series (August 2014): 5. Kuok, "The U.S.-Singapore Partnership," 4.

[8] Chua, Daniel. "Chapter Three: Singapore's Relations with the United States of America," in *The Little Nation That Can: Singapore's Foreign Relations and Diplomacy*, ed. Gillian Koh, *The National University of Singapore Society (NUSS)*, Commentary 26 (2017): 31.

[9] CSIS, "U.S. Alliances and Emerging Partnerships in Southeast Asia," 31. Kuok, "The U.S.-Singapore Partnership," 5.

[10] Kuok, "The U.S.-Singapore Partnership," 5. U.S. Congressional Research Service, "U.S.-Singapore Relations," (updated July 30 2020).

[11] Graham, Euan. "Southeast Asia in the US Rebalance: Perceptions from a Divided Region," *Contemporary Southeast Asia* 35, no. 3 (December 2013): 305-332.

35 Joint Strike Fighter program in 2003 – so far the first and only Southeast Asian country to have done so. Singapore also enjoys access to U.S. military training facilities, including three permanent advanced fighter jet training detachments in continental United States. The Singapore Armed Forces (SAF) conducts the biennial Exercise Forging Sabre in continental U.S., which helps hone its integrated strike capabilities, including a significant amount of American military technologies.[12] All these access renders the comparatively smaller-sized, leanly-manned SAF a degree of qualitative military edge to deter its neighbors in the event of worsening ties, and also complicates their security calculations by introducing the possibility that Washington might defend Singapore at least politically, if not militarily.[13]

Growing People-to-People Trust

Both sides remain interested and invested in increasing mutual trust and confidence. People-to-people ties have steadily progressed, facilitated by increasing educational and cultural exchanges, and tourism. There are over 4,500 Singaporean students in U.S. colleges and universities in 2020, representing a fifth of the total Singaporeans studying overseas.[14] With the opening of EducationUSA Advising Centre in November 2021, the number of Singaporean students considering the United States for higher education is likely to increase, post-pandemic. Meanwhile, there are currently over 1,000 Americans studying in world-class Singaporean institutions.

"These educational exchanges foster not just U.S.-Singaporean friendship but also trust and confidence between the two countries over the long term."

These educational exchanges foster not just U.S.-Singaporean friendship but also trust and confidence between the two countries over the long term. During his confirmation hearing, President Biden's nominee to be U.S. Ambassador to Singapore, Jonathan Kaplan, mentioned that more than half of the Singaporean Cabinet Ministers had studied in the United States, including Prime Minister Lee, who obtained a degree from Harvard University.

The prospect for U.S.-Singapore partnership looks promising if recent public opinion polls are any indication. A 2021 public opinion survey by Pew Research found that most Singaporeans (51%) hold a favorable view of the United States. The 2021 State of Southeast Asia Survey conducted by Singapore-based ISEAS Yusof Ishak Institute that focused on regional elites found that almost 85% of Singaporean security and foreign policy establishments welcome America's 'growing regional political and strategic influence.'[15] The figure represents a 10-point increase from the 2020 survey. When the question, "if ASEAN were forced to align itself with one of the two strategic rivals, which should it choose," 65.8% of Singaporean elites chose the United States. Also, over 70% of the same Singaporean respondents expressed confidence in the United States as a strategic partner and provider of regional security. At least 76% expected U.S. engagements with the region to increase under the Biden Administration.

Moving the strategic partnership forward

In this volume, six next-generation scholars and policy analysts from the United States and Singapore examined various issues important to bilateral relations. They provided fresh insights and offered policy prescriptions for moving the relationship forward.

Shaun Ee argues that while Singapore has become an established purchaser of U.S. defense technology, bilateral security cooperation has started to mature into an increasingly collaborative relationship, involving fields like cybersecurity and biosecurity. He posits that the rise of non-traditional security threats provides a unique opportunity to further advance bilateral cooperation while avoiding the impression that the Southeast Asian country has taken a side in the brewing U.S.-China strategic competition.

Matthew Merighi's chapter examines "the dynamics which make startup outreach an essential facet of defense technology competitiveness," and assesses the related core competencies of the United States and Singapore. He argues that both countries can leverage startups as a new source of defense technology cooperation and defense diplomacy connections.

Jasmine Ong reviews the history of the shared preferences of the United States and Singapore for multilateralism and revisits how both countries came to attach significant ideational value towards institutions. She makes a case for U.S.-Singapore collaboration in strengthening regional and global institutions.

James Guild takes a closer look at the U.S.-Singapore FTA, America's first and only bilateral FTA in Southeast Asia, and argues the trade deal has been a boon for both countries. For the United States, the FTA has expanded the options of U.S. investors and companies for engaging the Singaporean market and the wider ASEAN region, while also increasing U.S. exports that support American jobs. For Singapore, the FTA has helped transform the city-state into a major financial hub in one of the fastest growing regions in the world.

Ankush Wagle's chapter analyzes the contemporary U.S.–Singapore maritime security relations in the context of the Free and Open Indo Pacific (FOIP) concept. He posits that beyond the robust existing ties, the Indo-Pacific idea presents new opportunities for closer bilateral and multilateral maritime cooperation, albeit with potential divergences in thinking between the two sides.

Finally, Jarret Fisher provides a historical refresher of the bilateral relationship by comparing U.S.-Singapore and China-Singapore relations. Her chapter argues that Washington's continued recognition of the nature of Singaporean foreign policy being neither ideological nor in service of world powers is critical in advancing the bilateral cooperation.

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[12] Tham, Thrina. "Why Forging Sabre is One of SAF's Most Complex Exercises," *Pioneer*, Singapore Ministry of Defense, October 8, 2019, https://www.mindef.gov.sg/web/portal/pioneer/article/feature-article-detail/ops-and-training/2019-Q4/08oct19_news2

[13] Kuok, "The U.S.-Singapore Partnership," 2.

[14] International Trade Administration. "Education," Singapore – Country Commercial Guide, January 15, 2021, https://www.trade.gov/country-commercial-guides/singapore-education

[15] Seah, Sharon, et al. "The State of Southeast Asia: 2021 Survey Report," *ISEAS Yusof Ishak Institute* (February 10, 2021), https://www.iseas.edu.sg/wp-content/uploads/2021/01/The-State-of-SEA-2021-v2.pdf

2

U.S.-Singapore cooperation on tech and security: defense, cyber, and biotech*

Shaun Ee

Abstract

The partnership between the United States and Singapore is founded in no small part on the shared recognition of the value that technology has for national security. Over the last 55 years, Singapore has become an established purchaser of U.S. defense technology, but the past 20 years have also seen the U.S.-Singapore relationship mature into an increasingly collaborative one, tackling newer fields like cybersecurity and biosecurity. However, current geopolitical tensions present a challenge for Singapore, which strives to retain its strategic autonomy by maintaining positive relations with all parties. Paradoxically, the rise of non-traditional security threats may pave the way for greater bilateral cooperation by allowing Singapore to position itself as a hub for cooperation on regional security issues in Southeast Asia at large. In such spirit, this paper recommends that the United States and Singapore do the following: 1) in defense technology, co-develop niche capabilities in C4ISR and unmanned systems with peacetime applications; 2) in cybersecurity, improve their domestic resilience against sophisticated nation-state actors while also building regional capacity to counter cybercrime in Southeast Asia; and 3) in biosecurity, strengthen regional epidemiological surveillance to brace against possible future pandemics.

**This report was completed prior to Shaun Ee's government service and involves only open-source research. It was completed in a personal capacity, and the views and assessments covered within do not reflect the official policy or position of any agency of the Singapore Government.*

Introduction

Since independence in 1965, Singapore has long seen technology as essential for its survival—not just economically, but for defense and security, too. Boxed in geographically, Singapore's government has taken the view that technology is a 'force multiplier' essential to offsetting its spatial constraints.[1] It hence built up its military with acquisitions from other countries—including the United States —in the 1970s and 1980s, even while expanding its defense industry at home. But as Singapore's economy and defense industrial base have matured, it has progressively deepened ties with the United States, growing from an erstwhile client to a steadfast partner. In 2000, the two countries inaugurated the bilateral Defense Cooperation Committee to oversee defense technology cooperation, a testament to that shift in roles.

Twin revolutions have further underscored how science and technology (S&T) cooperation undergirds the two countries' security: first, the information revolution, and second, the pending biotech revolution. In 2015, they signed an Enhanced Defense Cooperation Agreement that identified cyber defense and biosecurity as areas for further cooperation. Washington and Singapore share concerns over the activity of advanced, nation-state-backed threat actors in cyberspace, particularly given an unnamed state's involvement in Singapore's largest data breach in 2018.[2] And Covid-19 has driven home the need for biosecurity cooperation, which will grow in importance as nascent fields like synthetic biology develop.

Bolstering the resilience of their respective societies against malicious actors remains a priority for both the United States and Singapore, such as in cyberspace against advanced nation-state espionage campaigns. But strengthening U.S.-Singapore ties on S&T for security issues does more than improving their respective domestic security—it also provides an opportunity to improve security in the greater Southeast Asian region. As a technologically and economically advanced country known diplomatically as a trusted broker, Singapore is ideal for mediating S&T knowledge flows between the United States and Southeast Asia. Existing regional training programs on cybersecurity are a prime example of this, such as the U.S.-Singapore Third Country Training Program, which helps anchor U.S. presence in the region while building capacity in Southeast Asia.

As the U.S.-Singapore relationship continues to blossom, searching for ways to insulate their own societies from the malicious use of new technologies should remain a focal point of the two countries' collaboration. But further regional capacity building should be an equal priority, as this will help cement the liberal, rules-based international order that both countries are so passionate about defending.

Defending forward: The roots of bilateral security cooperation

Singapore's strong defense relationship with the United States is rooted in the strategic realities it faces. As a small country, it depends on technology to 'level the playing field' with its much larger neighbors. But its size also prevents it from achieving defense-industrial sovereignty, forcing it to acquire technology from other major powers for its self-defense. Hence, the United States has played a historically important role in helping Singapore develop its deterrent capacity, although not an exclusive one. In turn, what the United States gained during the Cold War was a partner willing to embrace its continued presence, despite setbacks elsewhere in the region.

Following the Cold War, bilateral cooperation did not halt. Instead, it deepened, with Singapore's continued economic growth and stable political priorities permitting it to invest heavily in next-generation U.S. weapons platforms. Presently, Singapore's considerable force projection capabilities, built in no small part on U.S. equipment, allow it to deter potential aggressors effectively. More than that, however, the growth of its domestic defense industry has enabled it to play a proactive role as a collaborator in the relationship, although the fundamental inequity in size between the United States and Singapore makes true partnership difficult.

Defense tech cooperation, 1965 – 2000

The strategic context that Singapore's leaders face now is much the same as the one they faced in 1965: it lacks strategic depth, does not have the population to maintain a sizeable standing army, and depends on much larger neighbors for even basic food and water security. From its leaders' perspective, whether or not Singapore faces extant threats is immaterial because its inherent vulnerabilities expose it to economic and military coercion, if not outright invasion. Hence, from the start of independence, it has maintained the same core philosophy: it must 'invest in defense to deter threats from arising in the first place.'[3]

"…Singapore's considerable force projection capabilities, built in no small part on U.S. equipment, allow it to deter potential aggressors effectively."

This survival anxiety has been baked into the thinking of Singapore's leaders since its early days, with its first Prime Minister (PM) Lee Kuan Yew characterizing it as a 'small fish' that could not take its security for granted.[4] Initially, Singapore had hoped for several years to prepare itself for independence under the aegis of remaining British forces, but these hopes were quashed by the collapse of British power worldwide.[5] Facing an accelerated timetable for British withdrawal, it discreetly sought Israeli military advice, and on that basis, rapidly built up a conscript army through the 1960s and 1970s. This formed the core of its professed 'poisonous shrimp' strategy: in the words of then-PM Lee in 1966, making itself unpalatable enough that it would be 'left alone.'[6]

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[1] Huxley, Tim. *Defending the Lion City: The Armed Forces of Singapore*, The Armed Forces of Asia (St. Leonards, NSW Australia: Allen & Unwin, 2000).
[2] This was the 2018 SingHealth breach, in which 1.5 million patients' data was stolen.
[3] Manohara, Chinniah "Defense Procurement and Industry Policy—A Singapore Perspective," *Defense and Peace Economics* 9, no. 1–2 (March 1998): 119–36, https://doi.org/10.1080/10430719808404897.
[4] Lee, Kuan Yew. "Big and Small Fishes in Asian Waters" (National Archives of Singapore, June 15, 1966), https://www.nas.gov.sg/archivesonline/data/pdfdoc/lky19660615.pdf.
[5] Huxley, *Defending the Lion City*.
[6] Lee, "Big and Small Fishes in Asian Waters."

Yet, by the 1980s, Singapore's defense strategy was already maturing beyond this basic deterrence-by-punishment approach. Publicly, it still professed adherence to the 'poisonous shrimp' doctrine; more privately, it was acquiring force projection capabilities that permitted it to take an offensive, pre-emptive approach.[7] This approach, later dubbed the 'porcupine' strategy, relied increasingly on technology as a 'force multiplier' to offset Singapore's geographical constraints. Through the 1970s and 1980s, Singapore acquired air defense, early warning, and long-range strike capabilities that made up for its nonexistent hinterland. In the late 1980s, it turned to C3I capabilities (i.e., command, control, communications, and intelligence) to give itself a 'strategic edge.'[8]

Particularly in the air domain, the United States became Singapore's chosen supplier for many new capabilities. This choice was likely owed in part to the high quality and logistical support for U.S. equipment, but geopolitics may have been an added consideration. In the shadow of U.S. losses in Southeast Asia in the 1960s and 1970s, Singapore made a point to expedite U.S. regional presence by, for example, allowing it to use Tengah Airbase in the 1970s to conduct patrol flights in the Indian Ocean.[9]

However, Singapore's preference for continued U.S. engagement did not translate into an unqualified endorsement of U.S. platforms. Despite reliance on the United States for cutting-edge aircraft, Singapore has typically turned to European countries like France, Germany, and Sweden for naval capabilities.[10] It has also sought to improve its strategic autonomy by tasking domestic defense manufacturers with the production of smaller platforms and small arms. During occasional rocky spells in the U.S.-Singapore relationship, this willingness to hedge has paid dividends: for example, in the mid-1980s, when the United States refused to help upgrade Singaporean C-130s for aerial refueling, Israel instead stepped in to do the job.[11]

Overall, however, Singapore remained largely enthusiastic about U.S. equipment and U.S. engagement in the region. In 1990, Singapore signed a Memorandum of Understanding (MOU) with the United States, offering up the use of Singapore bases in 1990 following the departure of U.S. forces from Subic Naval Base and Clark Air Base in the Philippines. Later, it even customized Changi Naval Base on its own dime to be capable of housing an aircraft carrier, despite Singapore not having one of its own.[12] By the late 1990s, Singapore was spending up to US$2.5 billion per year, or two-thirds of its defense budget, on infrastructure and procurement—half of which went to foreign equipment and services. Within this, the largest source of foreign military sales was the United States, paving the way for deeper cooperation in 2000 and beyond.[13]

Defense tech cooperation, 2000 – present

The turn of the millennium marked a new phase for both U.S.-Singapore defense cooperation and the Singapore Armed Forces at large. Central to this was the maturation of Singapore's domestic defense industry, because it allowed Singapore to assume a role of not just purchaser, but also of partner with the United States.

From a domestic standpoint, the most significant change in defense procurement was the March 2000 establishment of the Defense Science and Technology Agency (DSTA) as the 'executive agent' of Singapore's Ministry of Defense (MINDEF), handling defense acquisition and managing defense research and development.[14] DSTA was carved out from MINDEF's Defense Technology Group (DTG), replacing a structure that was, in the words of DSTA's first director of procurement, 'not nimble and responsive enough to meet the challenges of the future.'[15] As a distinct legal entity, DSTA has greater autonomy than its predecessor to implement defense policy on MINDEF's behalf, which has helped Singapore meet the modernization requirements of the third-generation (3G) SAF.

In parallel to this repositioning of defense policy, Singapore also deepened defense tech cooperation with the United States by creating new forums and institutions. In 2000, it inaugurated the Defense Cooperation Committee (DCC), an annual bilateral forum at the Permanent Secretary/Undersecretary level to oversee defense tech cooperation between the two countries.[16] The DCC oversees 8 out of the 9 bilateral dialogues on U.S.-Singapore technology cooperation that are active as of 2019, although information is limited about the content and nature of these dialogues.[17] Likewise, information on U.S.-Singapore cooperation at the agency-to-agency level is generally not publicly available.

The 2000s also saw the United States increasingly recognize Singapore as a hub for research with national security applications. Alongside the DCC's creation, the

[7] Huxley, *Defending the Lion City*. Pak Shun Ng, *From Poisonous Shrimp to Porcupine: An Analysis of Singapore's Defence Posture Change in the Early 1980s*, Working Paper, No. 397 (Canberra: Australian National University, Strategic and Defense Studies Center, 2005), https://www.files.ethz.ch/isn/34067/042005_397_PoisonousShrimp.pdf.
[8] Huxley, *Defending the Lion City*. Huxley provides an excellent history of the pre-2000s SAF.
[9] Choong, William. "China-U.S. Relations: Singapore's Elusive Sweet Spot," *ISEAS Yusof Ishak Institute*, ISEAS Perspective, 80, no. 2020 (July 23, 2020): 10.
[10] "SIPRI Arms Transfers Database" (Stockholm International Peace Research Institute), accessed March 7, 2021, https://www.sipri.org/databases/armstransfers. Data covers major weapons transfers to Singapore, 1950-2019.
[11] Battilega, John, et al., "Country Study: Singapore," Transformations in Global Defense Markets and Industries: Implications for the Future of Warfare (U.S. National Intelligence Council, 2001), https://web.archive.org/web/20010721134114/http://www.cia.gov/nic/pubs/research_supported_by_nic/battilega/index.htm.
[12] Kuok, Lynn. "The U.S.-Singapore Partnership: A Critical Element of U.S. Engagement and Stability in the Asia-Pacific," Asian Alliances Working Paper Series (Brookings Institution, July 2016), https://www.brookings.edu/research/the-u-s-singapore-partnership-a-critical-element-of-u-s-engagement-and-stability-in-the-asia-pacific/.
[13] Huxley, *Defending the Lion City*.
[14] "About Defense Science & Technology Agency, DSO National Laboratories and Nanyang Technological University," Defense Science & Technology Agency, 2007, https://www.dsta.gov.sg/latest-news/news-releases/news-releases-2007/about-defence-science-technology-agency-dso-national-laboratories-and-nanyang-technological-university.
[15] Manohara, Chinniah. "Defense Procurement in Singapore" (Third International Acquisition/Procurement Seminar-Pacific, Singapore, September 18, 2000), https://www.dscu.mil/Pubs/Indexes/v.23_1/manohara.pdf.
[16] Ministry of Defense, Singapore. "News Release: Inaugural Meeting of the Singapore-U.S. Defense Cooperation Committee," April 26, 2000, National Archives of Singapore, https://www.nas.gov.sg/archivesonline/data/pdfdoc/MINDEF_20000426071.pdf.
[17] U.S. Embassy in Singapore. "Fact Sheet: U.S.-Singapore Defense Cooperation," July 2019, https://sg.usembassy.gov/wp-content/uploads/sites/197/Fact-Sheet-Defense-Cooperation-small.pdf. One other source states that the two participate instead in 12 "military forums focused on science and technology cooperation" together, which is three more than the embassy's number; most likely, these additional forums are not strictly bilateral in nature. See: Bureau of Political-Military Affairs, "U.S. Security Cooperation With Singapore," U.S. Department of State, July 15, 2019, https://www.state.gov/u-s-security-cooperation-with-singapore/.

Office of Naval Research Global (ONR Global) opened a branch in Singapore in 2000, later staffed up to a full office in 2006.[18] ONR Global monitors and funds research in emerging technologies of interest to the U.S. Navy, although its scope of work in Singapore remains relatively modest. In 2013, it had four in-country experts and supported about $500,000 in Singapore-based projects, with the majority of that going directly toward research grants.[19] ONR Global Singapore also works with ONR Global Tokyo to fund projects in other Asian countries. In 2013, projects totaled $4.02 million across the Area of Responsibility of what was then the U.S. Pacific Command (now the U.S. Indo-Pacific Command).

However, U.S. defense tech sales to Singapore have continued to dwarf these efforts. Between 2014 and 2019 alone, the United States authorized US$37.6 billion in defense sales to Singapore under the Direct Commercial Sales scheme, with an additional US$7.34 billion government-to-government sales cases being active under the Foreign Military Sales scheme.[20] For context, the country's overall defense budget allocation in 2020 was $10.8 billion.[21] As true of the pre-2000s period, aircraft-related sales were a large slice of this, with the two largest deals of the 2010s being a $2.43 billion upgrade of Singapore's F-16s in 2014, and a $2.75 billion order of F-35s in 2020.[22]

Major aircraft deals like these will undoubtedly be a continued feature of Singapore's partnership with the United States, but other trends—such as Singapore's falling birth rate, which promises to substantially reduce its manpower pool for conscription—mean that Singapore is also being forced to think more creatively about how to equip its forces. In the face of what could be a one-third decline in eligible conscripts from the late 2010s to 2030, the country is increasingly exploring unmanned and other capabilities to augment its firepower.[23] The development of these advanced technological capabilities could provide a focal point for U.S.-Singapore collaboration in the future.

The changing regional security environment, 2000 – present

Beyond Singapore coming into its own, another decisive factor shaping its relationship with the United States has been the evolving global strategic environment. The end of the Cold War set the stage for a more complex threat environment, featuring the coexistence of hybrid warfare alongside great-power conflict, and state actors alongside non-state actors. U.S. strategy in Southeast Asia has undergone two major shifts in the 21st century—first, the War on Terror and second, the Pivot to Asia—but while the former shift provided Singaporean policymakers with straightforward opportunities for closer cooperation, the latter shift has been more complex for Singaporean policymakers to navigate.

The prospect of worsening U.S.-China relations has led Singapore's leaders to express concern over Asian countries being forced to choose between the two major powers, with among the most public expressions of concern being an article published by PM Lee Hsien Loong in the leading magazine *Foreign Affairs*.[24] While Singapore has remained receptive to strengthening U.S.-Singapore ties, such concerns mean that it is also cautious about taking actions that could prove regionally destabilizing. Nonetheless, the peacetime applications of certain defense technologies—such as artificial intelligence (AI) for disaster relief—present an opportunity for the two countries to collaborate in a measured way.

"While Singapore has remained receptive to strengthening U.S.-Singapore ties, such concerns mean that it is also cautious about taking actions that could prove regionally

Post-2000s strategic priorities: the war on terror and the pivot to asia

Through the first decade of the 21st century, the specter of 9/11 haunted both countries and spurred them to work together beyond conventional security ties. In 2003, they affirmed a shared interest in counterterrorism and nonproliferation; then, in 2005, they followed on by signing a Strategic Framework Agreement (SFA) that brought bilateral work on both traditional and non-traditional security work under the same umbrella.[25] Beyond expanding the scope of their cooperation, the 2005 SFA also elevated their relationship by recognizing Singapore as a 'Major Security Cooperation Partner' of the United States, a unique designation that, according to PM Lee Hsien Loong, only Singapore had received as of 2018.[26]

Following the high-level 2005 SFA, the two countries rolled out a number of other homeland security initiatives. In 2007, their respective homeland security agencies signed an agreement to collaborate on technology for counterterrorism, cybersecurity, and other purposes.[27] In 2009, the United States established a regional office of its

[18] Vu, Cung. "Office of Naval Research Global," https://sites.nationalacademies.org/cs/groups/pgasite/documents/webpage/pga_147331.pdf.
[19] Ibid. This total is across three ONR Global programs: the Collaborative Science Program, which supports seminars and workshops; the Visiting Scientist Program, which funds travel of non-U.S. scientists to the United States; and the Naval International Cooperative Opportunities Program, which provides direct funding for research projects by international scientists. Expenditure across these three programs totaled about $13.7 million in 2013.
[20] Bureau of Political-Military Affairs, "U.S. Security Cooperation With Singapore."
[21] Parameswaran, Prashanth. "What Does Singapore's New Defense Budget Say About the Country's Security Thinking?," *The Diplomat*, February 24, 2020, https://thediplomat.com/2020/02/what-does-singapores-new-defense-budget-say-about-the-countrys-security-thinking/.
[22] U.S. Defense Security Cooperation Agency. "Singapore - F-16 Block 52 Upgrade," January 14, 2014, https://www.dsca.mil/press-media/major-arms-sales/singapore-f-16-block-52-upgrade. Reuters Staff, "U.S. State Dept. Approves Sale of 12 F-35 Jets to Singapore," *Reuters*, January 10, 2020, https://www.reuters.com/article/us-singapore-defence-lockheed-idUSKBN1Z90G9.
[23] Ungku , Fathin, and Miyoung Kim, "Singapore Armed Forces Going More Hi-Tech as Recruiting Levels Seen Sliding," *Reuters*, June 30, 2017, https://www.reuters.com/article/us-singapore-defence-idUSKBN19L19R.
[24] Lee, Hsien Loong "The Endangered Asian Century," *Foreign Affairs*, December 18, 2020, https://www.foreignaffairs.com/articles/asia/2020-06-04/lee-hsien-loong-endangered-asian-century.
[25] Singapore Ministry of Defense. "Factsheet - The Strategic Framework Agreement," July 12, 2005, National Archives of Singapore, https://www.nas.gov.sg/archivesonline/data/pdfdoc/MINDEF_20050712001/MINDEF_20050712003.pdf.
[26] Lee, Hsien Loong. "Remarks by PM Lee Hsien Loong at the Joint Press Engagement with U.S. VP Mike Pence" (Prime Minister's Office, Singapore, January 18, 2019), https://www.pmo.gov.sg/Newsroom/remarks-pm-lee-hsien-loong-joint-press-engagement-us-vp-mike-pence.
[27] U.S. Department of Homeland Security and Singapore Ministry of Home Affairs. "Agreement Between the Government of the United States of America and the Government of Singapore on Cooperation in Science and Technology for Homeland/Domestic Security Matters," March 27, 2007, https://www.dhs.gov/xlibrary/assets/agreement_us_singapore_sciencetech_cooperation_2007-03-27.pdf.

Defense Threat Reduction Agency (DTRA), supporting the efforts of the United States throughout Asia to reduce the risk from chemical, biological, radiological, and nuclear weapons.[28] However, even as these initiatives were being implemented, a different set of geopolitical forces were entering into play, requiring the recalibration of the U.S.-Singapore relationship.

The early 2010s saw tensions begin to ratchet up in U.S.-China relations, with China's expanded international footprint under Hu Jintao met with the Obama administration's corresponding Pivot to Asia. Since then, U.S.-China relations have further deteriorated, placing Singapore in a difficult position given its stated preference for an inclusive regional architecture and its strong trade and investment ties with both countries. In a *Foreign Affairs* article, PM Lee Hsien Loong has publicly cautioned that should U.S.-China frictions worsen to the point that Singapore and other Asian countries are forced to pick sides, the region's future prospects could be placed in jeopardy.[29]

Nonetheless, PM Lee has expressed that Asian countries regard the United States as a 'resident power' in Asia, and Singapore has been receptive toward overtures to strengthen U.S.-Singapore relations through the 2010s. In 2012, with the launch of a new annual dialogue, the U.S.-Singapore relationship 'moved… up a weight class' to become a strategic partnership.[30] The same year, the two countries agreed that the United States could deploy up to four Littoral Combat Ships (LCSs) to Singapore on a rotational basis and without basing arrangements. [31] The LCS program's rollout has been troubled, with delays resulting in only three single-ship deployments by 2018, due in part to an unreliable propulsion system and weathering from the long journey between continental United States and Singapore, but U.S. Navy officials have expressed a continued intent to consolidate the program.[32]

In 2015, which marked the 25th anniversary of the 1990 MOU, the two countries further deepened security ties by signing an Enhanced Defense Cooperation Agreement (Enhanced DCA). Combined with other changes, this led one Singaporean official to assess in 2015 that the U.S.-Singapore defense relationship looked 'qualitatively different than… just five years ago.'[33] The 2015 Enhanced DCA built on the previous DCA included in the 2005 SFA, laying out a framework that included technology as one of five key areas for cooperation.[34] Beyond these core five areas, it also highlighted other new arenas for cooperation: humanitarian assistance and disaster relief (HA/DR), cyber defense, biosecurity, and public communications.

Future outlook and fundamental constraints

The Enhanced DCA's expanded ambit is particularly important because it provides additional avenues for U.S.-Singapore security cooperation beyond conventional defense. While Singapore has publicly affirmed the value of a continued U.S. presence in the Pacific, it has also been emphatic about the limits of its cooperation with the United States as a partner rather than a formal ally.[35] Singapore is unlikely to engage in joint defense endeavors that might worsen the regional security environment or compromise its claim to neutrality.[36] For example, when the U.S. Secretary of the Navy lofted the idea of stationing a 'First Fleet' out of Singapore in late 2020, Singapore was quick to direct attention to the 2012 agreement on LCS deployments as the 'standing arrangement' between the two countries.[37]

"Developing these niche high-tech tools allows the United States and Singapore to keep their collaboration subdued but still substantive."

Looking to the future, this means that dual-use technology with peacetime applications could be one of the most promising avenues for cooperation, as seen from a 2019 bilateral agreement on AI applications for HA/DR.[38] Within HA/DR, numerous AI applications exist, ranging from computer vision in remote sensing to robotic autonomy in hazardous terrain.[39] These are all valuable in peacetime, particularly given neighboring Indonesia's susceptibility to natural disasters, and have potential value to both countries' militaries. Developing these niche high-tech tools allows the United States and Singapore to keep their collaboration subdued but still substantive.

The homeland angle: cybersecurity and biosecurity

Aside from the above security concerns, however, technological advances since the 2000s have also introduced a new series of threats. Here, ironically, the growing complexity of the threat environment may make it

[28] "Defense Threat Reduction Agency (DTRA)" U.S. Embassy in Singapore, accessed April 18, 2021, http://sg.usembassy.gov/embassy/singapore/sections-offices/defense-threat-reduction-agency-dtra/.
[29] Lee, "The Endangered Asian Century."
[30] Adelman, David. "The U.S.-Singapore Strategic Partnership: Bilateral Relations Move Up a Weight Class," *The Ambassador's Review*, 2012. At the time of this comment, Adelman was the serving U.S. Ambassador to Singapore.
[31] Kuok, "The U.S.-Singapore Partnership." Ristian Atriandi Supriyanto, "U.S. Pivots to Maritime Southeast Asia," in *The South China Sea Disputes*, by Yang Razali Kassim (World Scientific, 2017), 109–12, https://doi.org/10.1142/9789814704984_0025.
[32] Larter, David. "U.S. Navy Prepares Major Surge of Littoral Combat Ship Deployments," *Defense News*, July 31, 2020, sec. Naval, https://www.defensenews.com/naval/2020/07/31/the-us-navy-is-preparing-a-major-surge-of-lcs-deployments/. Dzirhan Mahadzir, "CNO: U.S. Still Committed to Littoral Combat Ship Deployments in Southeast Asia," *USNI News*, November 1, 2018, sec. News & Analysis, https://news.usni.org/2018/11/01/cno-u-s-still-committed-littoral-combat-ship-deployments-southeast-asia.
[33] Parameswaran, Prashanth."Strengthening U.S.-Singapore Strategic Partnership: Opportunities and Challenges," *RSIS Commentary* (blog), August 8, 2016, https://www.rsis.edu.sg/rsis-publication/rsis/co16201-strengthening-us-singapore-strategic-partnership-opportunities-and-challenges/.
[34] Kuok, "The U.S.-Singapore Partnership." Singapore Ministry of Defense, "Singapore, U.S. Step Up Defence Cooperation," December 8, 2015, /web/portal/mindef/news-and-events/latest-releases/article-detail/2015/december/2015Dec08-News-Releases-02572. The five key areas outlined in the framework were military, policy, strategy, technology, and non-conventional security matters (including piracy and terrorism).
[35] Kuok, "The U.S.-Singapore Partnership."
[36] Lee, "The Endangered Asian Century." Cortez Cooper and Michael Chase, *Regional Responses to U.S.-China Competition in the Indo-Pacific: Singapore* (RAND Corporation, 2020), https://doi.org/10.7249/RR4412.5.
[37] Singapore Ministry of Defense. "Reply to Queries on U.S. SECNAV's Calls for New U.S. 1st Fleet Out of Singapore," November 18, 2020, https://www.mindef.gov.sg/web/portal/mindef/news-and-events/latest-releases/article-detail/2020/November/18nov20_mq.
[38] U.S. Department of Defense. "JAIC and DSTA Forge Technology Collaboration," June 27, 2019, https://www.defense.gov/Newsroom/Releases/Release/Article/1888859/jaic-and-dsta-forge-technology-collaboration/.
[39] Gupta, Ritwik."SEI Podcast Series: AI in Humanitarian Assistance and Disaster Response," interview by Andrew Mellinger, September 2019, https://resources.sei.cmu.edu/library/asset-view.cfm?assetid=634757.

easier for Singapore and the United States to find ways to collaborate. While there is a limit on how closely the United States and Singapore can collaborate on conventional defense technology, security solutions in cybersecurity and biosecurity are inherently multilateral. Rather than doubling down in defense technology, a particularly promising path forward for U.S.-Singapore S&T security cooperation appears to be branching out into other areas.

Cybersecurity: the state of play

Both countries have good reason to embrace international cybersecurity collaboration, as they have been directly impacted by a slew of cyber incidents in the past several years. By its size and prominence as a target, the United States has suffered more major incidents, ranging from election interference in 2016 to the Baltimore ransomware attack of 2019 to the Sunburst (or SolarWinds) supply chain compromise targeting U.S. government agencies, discovered in early 2021. [40] But neither has Singapore gotten off scot-free: most prominently in 2018, healthcare institutions under the SingHealth umbrella had their systems breached by what was likely a nation-state actor, threatening Singapore's national security by exfiltrating data that included the personal medical information of PM Lee Hsien Loong.[41]

As seen in the Sunburst and SingHealth incidents, sophisticated nation-state espionage campaigns suggest that one priority area for both Singapore and the United States should be building out advanced defensive measures to guard against nation-state espionage. Given the two countries' high level of digitization, cyber-enabled espionage is a particularly attractive vector for other nation-states seeking access to sensitive information about the economic and national security of the United States and Singapore. At the same time, the two countries cannot neglect other varied threat actors such as financially motivated criminal enterprises, or other cyber incidents such as destructive ransomware attacks. Large-scale ransomware attacks, for example, can disrupt vital services and debilitate companies, with the NotPetya attack in 2017 freezing port operations and costing shipping giant Maersk up to US$300 million. [42] Given the cross-border repercussions of such incidents, it is in the interests of the United States and Singapore to bolster the resilience of not only their own societies but also the region's.

Cybersecurity: existing U.S.-Singapore cooperation

While formal U.S.-Singapore cooperation on cybersecurity has existed for some time, their joint efforts have accelerated since the mid-2010s, as their respective governments have restructured their institutions to place cybersecurity work under prominent national-level agencies. In 2015, Singapore founded the Cyber Security Agency (CSA), absorbing a range of other agencies from its Ministry of Home Affairs, Infocomm Development Authority, and so on.[43] Not long after, in 2018, the United States elevated its National Protection and Programs Directorate, housed under the U.S. Department of Homeland Security, to the Cybersecurity and Infrastructure Security Agency (CISA), reflecting the independent realization in both countries of the need to empower national agencies to combat these issues.[44]

The two countries signed an MOU on 'Cooperation in the Area of Cybersecurity' in August 2016, the first such agreement between the United States and an Association of Southeast Asian Nations (ASEAN) member-state. [45] Per CSA's press release, the agreement covers a wide range of activities such as incident response coordination, joint cybersecurity exercises, collaboration on regional capacity building, and sharing best practices and information between their respective national Computer Emergency Response Teams (CERTs).[46] This MOU was signed on the sidelines of a larger bilateral meeting between then-U.S. President Barack Obama and Singapore PM Lee Hsien Loong, and so was accompanied by a Singapore-U.S. joint statement committing the two countries to a multi-stakeholder approach to internet governance and a common approach to cyber stability.[47]

Beyond the MOU, another initiative that both countries have pushed is cybersecurity capacity building in Southeast Asia. The region is particularly vulnerable on this front, with the cybersecurity sector lagging the rapidly growing digital economies of countries such as Indonesia and the Philippines. Singapore has turned cybersecurity into a top-tier agenda item in its regional engagements, aggressively pushing both capacity-building and norms-setting during its 2018 chairmanship of ASEAN. [48] In tandem with its diplomatic leadership, it has also proactively invested in regional cybersecurity, such as by launching a S$10-million ASEAN Cyber Capacity Program in 2016 and an ASEAN-Singapore Cybersecurity Center of Excellence in 2019.[49]

For its part, the United States has been keen to support Singapore's efforts. Their cooperation dates back

[40] Though this espionage campaign is most commonly known as the "SolarWinds attack," this article refers to it by the name of one key piece of malware, "Sunburst," since SolarWinds was the company affected and only one of several.

[41] Singapore has not publicly attributed this attack beyond affirming that the responsible party was likely a nation-state. Kevin Kwang, "Singapore Health System Hit by 'Most Serious Breach of Personal Data' in Cyberattack; PM Lee's Data Targeted," *CNA*, July 20, 2018, https://www.channelnewsasia.com/news/singapore/singhealth-health-system-hit-serious-cyberattack-pm-lee-target-10548318.

[42] Leovy, Jill. "Cyberattack Cost Maersk as Much as $300 Million and Disrupted Operations for 2 Weeks," *Los Angeles Times*, August 18, 2017, sec. Business, https://www.latimes.com/business/la-fi-maersk-cyberattack-20170817-story.html.

[43] Tan, Weizhen. "New National Agency to Tackle Cyber Threats," *TODAYonline*, January 28, 2015, https://www.todayonline.com/singapore/new-national-agency-tackle-cyber-threats. Though housed under the Prime Minister's Office, the CSA is managed administratively by the Ministry of Communications and Information. Its current head, David Koh, has a concurrent position at MINDEF. See: Cyber Security Agency of Singapore, *Singapore's Cybersecurity Strategy*, 2016.

[44] Cimpanu, Catalin. "Trump Signs Bill That Creates the Cybersecurity and Infrastructure Security Agency," *ZDNet*, November 16, 2018, https://www.zdnet.com/article/trump-signs-bill-that-creates-the-cybersecurity-and-infrastructure-security-agency/.

[45] Hung, Harry. "Confronting Cybersecurity Challenges through U.S.-Singapore Partnership," *RSIS Commentary* (blog), August 24, 2016, https://www.rsis.edu.sg/rsis-publication/rsis/co16215-confronting-cybersecurity-challenges-through-us-singapore-partnership/.

[46] Cyber Security Agency of Singapore. "Singapore Strengthens Partnership with the United States," August 3, 2016, https://www.csa.gov.sg/news/press-releases/singapore-us-mou.

[47] Office of the Press Secretary. The White House, "Joint Statement by the United States of America and the Republic of Singapore," August 2, 2016, https://obamawhitehouse.archives.gov/the-press-office/2016/08/02/joint-statement-united-states-america-and-republic-singapore.

[48] Parameswaran, Prashanth. "ASEAN Cybersecurity in the Spotlight Under Singapore's Chairmanship," *The Diplomat*, May 2, 2018, https://thediplomat.com/2018/05/asean-cybersecurity-in-the-spotlight-under-singapores-chairmanship/.

[49] Iswaran, S. "Opening Remarks by Mr. S. Iswaran, Minister for Communications and Information, At The ASEAN Ministerial Conference on Cybersecurity" (The Third ASEAN Ministerial Conference on Cybersecurity (AMCC), Singapore, September 19, 2018), https://www.mci.gov.sg/pressroom/news-and-stories/pressroom/2018/9/opening-remarks-by-mr-s-iswaran-at-the-asean-ministerial-conference-on-cybersecurity. Both the $10 million and $30 million sums are intended to be spent over a five-year span.

to the 2012 establishment of the Singapore-U.S. Third Country Training Program (TCTP), which aims to improve regional connectivity and resilience by providing workshops on topics ranging from cybersecurity to trade facilitation. By 2017, the TCTP had trained 1,000 participants from ASEAN member states, though these were not exclusively cybersecurity-related trainings.[50] In 2018, the two countries additionally agreed to implement a Singapore-U.S. Cybersecurity Technical Assistance Program for ASEAN member-states, which would deliver three training workshops annually.[51] These joint capacity-building efforts are promising and could provide a model for cooperation in other areas.

Biosecurity: the state of play

The two countries also identified biosecurity as an area for future cooperation in the 2015 Enhanced DCA, a choice that has proven prescient given the ongoing disruption caused by Covid-19. However, previous unofficial dialogues suggest that experts from both countries differ somewhat in their view of the issue. In a 2014 bilateral dialogue convened by the Johns Hopkins Center for Health Security (CHS), U.S. participants were particularly concerned about deliberate biological attacks, while Singaporean participants indicated that naturally occurring pandemics remained their paramount focus.[52] That perception gap appears to have narrowed in recent years, with Southeast Asian discussants elevating the threat of bioterrorism in the most recent 2019 dialogue, though it remains to be seen how Covid-19 will shape this.[53]

Historically, naturally occurring pandemics have been of greatest concern in Singapore and Southeast Asia—likely the reason that they are top-of-the-mind for regional biosecurity experts. By contrast, it was the 2001 anthrax attacks that highlighted biosecurity threats in the United States. [54] For Asia-Pacific countries, this heightened consciousness has come with certain boons. In all likelihood, one reason that politically diverse countries such as Singapore, Taiwan, and Vietnam could respond effectively to Covid-19 was their prior experience with the severe acute respiratory syndrome (SARS) outbreak from 2002 to 2004.[55] Experiences such as SARS forced many of these countries to put strong pandemic preparedness programs in place and equipped medical specialists with necessary knowledge. However, past experience alone does not guarantee future safety, and the continued role of Southeast Asia as a likely origin point for future pandemics demands vigilance on the part of Singapore and the United States.

Future pandemics are likely to stem from emerging infectious diseases (EIDs)—that is, diseases that are either new or spreading rapidly—and particularly EIDs of zoonotic (i.e., animal) origin, to which humans lack existing immunity. [56] For various reasons, Southeast Asia is a hotspot for such EIDs: it features a diverse range of pathogens, has environmental conditions (e.g., climate) that favor mutation and adaptation of these pathogens, and is home to dense and mobile human populations that regularly interact with animals. [57] As Covid-19 demonstrates, these EIDs can spread quickly across national borders, meaning that even a strong domestic public health infrastructure such as Singapore's does not guarantee protection against EIDs originating in other countries.

Meanwhile, biological incidents with human involvement also remain a real and growing possibility. Such incidents could take several forms, including accidental 'lab leaks' or deliberate bioterror attacks. For now, the chance of such incidents occurring in Southeast Asia remains low because of the limited maturity of regional biotech research, but this may not remain true in the future. Singapore, for example, has announced that it will be building ASEAN's first biosafety level four (BSL-4) lab, which will be equipped to deal with the world's most dangerous pathogens.[58] This will be a boon for research into countermeasures against such pathogens, but as it and other countries continue to construct such facilities, they must ensure that safety measures are followed appropriately.[59]

Particularly concerning for the United States and Singapore is the development of new biotech capabilities that could make it easier for non-state actors to design or manufacture biological weapons. Currently, there are high barriers to doing so, as this depends on unreliable and idiosyncratic techniques that it takes years of specialized training to master. [60] But several trends, such as the declining cost of DNA synthesis, the development of new techniques for DNA manipulation like CRISPR-Cas9, and the rise of computer-aided design tools and automation, all have the potential to lower these barriers.[61] Though the probability of such an event remains low, its potential impact could be very high. Combined with other factors, such as the continued threat of extremism in the region and the complexity of a response that must necessarily bridge

[50] Singapore Ministry of Foreign Affairs. "Singapore - United States Third Country Training Program," August 4, 2018, http://www.mfa.gov.sg/Newsroom/Announcements-and-Highlights/2018/08/TCTPsigning.
[51] Cyber Security Agency of Singapore. "Singapore and the United States Sign Declaration of Intent on Cybersecurity Technical Assistance Program," November 16, 2018, https://www.csa.gov.sg/news/press-releases/singapore-and-the-us-sign-doi-on-cybersecurity-technical-assistance-programme.
[52] Gronvall, Gigi K. et al., "Singapore-U.S. Strategic Dialogue on Biosecurity" (Fort Belvoir, VA: Defense Technical Information Center, July 1, 2014), https://doi.org/10.21236/ADA612377.
[53] Inglesby, Tom, et al., "Southeast Asia Strategic Multilateral Biosecurity Dialogue: Meeting Report from the 2019 Dialogue Session" (Johns Hopkins Center for Health Security, May 2019), https://www.centerforhealthsecurity.org/our-work/publications/southeast-asia-strategic-multilateral-biosecurity-dialogue.
[54] Gronvall, et al., "Singapore-U.S. Strategic Dialogue on Biosecurity."
[55] One particularly compelling example of this is Japan, which managed to avoid massive outbreaks despite not instituting a lockdown because of Japanese scientists' understanding that Covid-19—like SARS—would feature indoor super-spreading events. See: Zeynep Tufekci, "This Overlooked Variable Is the Key to the Pandemic," *The Atlantic*, September 30, 2020, https://www.theatlantic.com/health/archive/2020/09/k-overlooked-variable-driving-pandemic/616548/.
[56] McArthur, Donna Behler. "Emerging Infectious Diseases," *The Nursing Clinics of North America* 54, no. 2 (June 2019): 297–311, https://doi.org/10.1016/j.cnur.2019.02.006. Brian McCloskey et al., "Emerging Infectious Diseases and Pandemic Potential: Status Quo and Reducing Risk of Global Spread," *The Lancet Infectious Diseases* 14, no. 10 (October 1, 2014): 1001–10, https://doi.org/10.1016/S1473-3099(14)70846-1.
[57] Coker, Richard J., et al., "Emerging Infectious Diseases in Southeast Asia: Regional Challenges to Control," *The Lancet* 377, no. 9765 (February 2011): 599–609, https://doi.org/10.1016/S0140-6736(10)62004-1.
[58] Fabian Koh, "Budget Debate: $90m to Be Spent on Singapore's First Top-Level Biosafety Lab, to Be Operational by 2025," *The Straits Times*, March 1, 2021, https://www.straitstimes.com/singapore/politics/90-million-to-be-spent-on-singapores-first-top-level-biosafety-lab-to-be.
[59] Gronvall et al., "Singapore-U.S. Strategic Dialogue on Biosecurity."
[60] Jefferson, Catherine, Filippa Lentzos, and Claire Marris, "Synthetic Biology and Biosecurity: Challenging the 'Myths,'" *Frontiers in Public Health* 2 (August 21, 2014), https://doi.org/10.3389/fpubh.2014.00115.
[61] Committee on Strategies for Identifying and Addressing Potential Biodefense Vulnerabilities Posed by Synthetic Biology. *Biodefense in the Age of Synthetic Biology* (The National Academies of Sciences, Engineering, and Medicine, 2018), https://doi.org/10.17226/24890.

national security and healthcare agencies, it is prudent for both countries to develop a playbook for this eventuality.[62]

Biosecurity: existing U.S.-Singapore cooperation

Compared with defense technology and cybersecurity, U.S.-Singapore cooperation on biosecurity is not as formally codified. While cybersecurity cooperation is addressed by, for example, the 2016 MOU and the 2018 agreement on regional technical assistance, there are no similar agreements on biosecurity. However, the United States and Singapore do participate in various multilateral forums such as the 70-country Global Health Security Agenda, launched in 2014 to bolster international capacity in combating infectious diseases.[63]

Singapore is also home to the U.S. Navy Medical Research Center—Asia (NMRCA), established in 2013 following the closure of its predecessor, Naval Area Medical Research Unit 2 (NAMRU-2) in Jakarta, Indonesia.[64] NMRCA manages a variety of projects across Southeast Asia, with a particular focus on research and surveillance of EIDs, and totaled 120 staff, including a detachment in Cambodia, as of 2019.[65] Like other cases, such as the 1990 MOU on the use of Singapore's naval facilities, NMRCA's relocation was the result of Singapore being willing to accommodate a U.S. military presence when other countries refused to do so. Political tailwinds in Indonesia led to the closure of NAMRU-2 in 2010, with the presence of U.S. Navy personnel deemed a non-starter, and NAMRU-2 staff were forced to relocate to Pearl Harbor until talks with Singapore were finalized.[66]

The United States and Singapore have also helped kick-start a Track II biosecurity dialogue in the region, led by the Johns Hopkins Center for Health Security (CHS). In 2014, CHS launched the dialogue as a U.S.-Singapore bilateral dialogue, but it has progressively expanded to include Indonesia, Malaysia, the Philippines, and Thailand as of 2019.[67] Though the dialogue is very much not a formal state-to-state Track I diplomatic effort, it nonetheless remains a valuable platform for regional biosecurity coordination given the dearth of similar dialogues and underscores how U.S.-Singapore biosecurity cooperation must necessarily take a holistic regional perspective over a purely bilateral approach.

Future opportunities for collaboration

Though the Enhanced DCA embraces cooperation in all three spheres, the general organizing principles for U.S.-Singapore cooperation in defense technology, cybersecurity, and biosecurity are all profoundly different. By its nature, defense technology cooperation is a particularly bilateral affair; it is also where the asymmetry of the relationship is most keenly felt. Despite the strides that Singapore's domestic defense industry has made, the chance of successful sales to the United States remains limited, and what sales there might be are far exceeded by Singapore's formidable appetite for cutting-edge U.S. platforms that it cannot produce itself.[68] Still, the two countries' shared interest in automation and robotics could, if pursued, lead to useful niche applications.

By contrast, U.S.-Singapore cooperation in cybersecurity and biosecurity—particularly the latter—is much better disposed to multilateral efforts. That makes their collaboration more regionally palatable and adds value to Singapore's contribution in its familiarity with Southeast Asian culture and politics and its ability to act as a hub for building regional capacity and networks. In cybersecurity, nation-state espionage campaigns will likely be a shared concern for the two countries, and they should improve both their own and other countries' defenses by prioritizing industrial sectors that nation-states frequently target, protecting against vectors of attack that nation-states frequently use. In biosecurity, the possibility of future pandemics arising elsewhere in Southeast Asia means that the United States and Singapore should put regional cooperation at the forefront and bolster epidemiological surveillance and response in other countries.

"In biosecurity, the possibility of future pandemics arising elsewhere in Southeast Asia means that the United States and Singapore should put regional cooperation at the forefront and bolster epidemiological surveillance and response in other countries. "

Defense cooperation: research and development

Generally, among the most promising areas for bilateral collaboration in the defense technology space is the joint development of improved capabilities in C4ISR (i.e., command, control, communications, computers, intelligence, surveillance, and reconnaissance), particularly unmanned systems or systems with potential peacetime use.[69] On the U.S. side, there is a clear need for ISR (intelligence, surveillance, and reconnaissance) in particular: over two decades in the Middle East, the United States has enjoyed a largely unchallenged advantage in ISR,

[62] Inglesby et al., "Southeast Asia Strategic Multilateral Biosecurity Dialogue: Meeting Report from the 2019 Dialogue Session."
[63] Jenkins, Bonnie. "Now Is the Time to Revisit the Global Health Security Agenda," *Brookings Institution* (blog), March 27, 2020, https://www.brookings.edu/blog/order-from-chaos/2020/03/27/now-is-the-time-to-revisit-the-global-health-security-agenda/.
[64] U.S. Embassy in Singapore. "Naval Medical Research Center-Asia (NMRC-A)," accessed April 18, 2021, http://sg.usembassy.gov/embassy/singapore/sections-offices/naval-medical-research-center-asia-nmrc/. Sophal Ear, "Emerging Infectious Disease Surveillance in Southeast Asia: Cambodia, Indonesia, and the U.S. Naval Area Medical Research Unit 2," *Asian Security* 8, no. 2 (May 1, 2012): 164–87, https://doi.org/10.1080/14799855.2012.686338.
[65] U.S. Embassy in Singapore. "Naval Medical Research Center-Asia (NMRC-A)." U.S. Embassy in Singapore, "Fact Sheet: U.S.-Singapore Defense Cooperation."
[66] Ear, "Emerging Infectious Disease Surveillance in Southeast Asia." Doris Ryan, "Naval Medical Research Center – Asia Officially Opens Its Doors," *Naval Medical Research and Development News*, October 2013, https://upload.wikimedia.org/wikipedia/commons/d/d8/Naval_Medical_Research_and_Development_News_Vol_V_Issue_10_%28IA_NMRDNewsVolVIssue10%29.pdf.
[67] For more, see the CHS website, which provides meeting notes and additional materials for the dialogue, which has met about annually from 2014-19. In 2019, the participants additionally issued a joint statement: Anita Cicero et al., "Southeast Asia Strategic Multilateral Dialogue on Biosecurity," *Emerging Infectious Diseases* 25, no. 5 (May 2019), https://doi.org/10.3201/eid2505.181659.
[68] For example, Singapore proved unsuccessful in its attempt to sell Bionix vehicles to the United States in what would have been a $7 billion deal. See: Ron Matthews and Collin Koh, "Singapore's Defence-Industrial Ecosystem," in *The Economics of the Global Defence Industry*, ed. Keith Hartley and Jean Belin, 1st ed. (New York: Routledge, 2019), https://doi.org/10.4324/9780429466793.
[69] Cooper and Chase, *Regional Responses: Singapore*.

but it now faces the prospect of a major power conflict that could strip this advantage away.[70] Under such a scenario, kinetic attacks and electronic warfare could imperil U.S. air- and space-based ISR assets, which makes it important for the United States to retool its ISR platforms for greater robustness and survivability.

Robust C4ISR capabilities are similarly crucial for Singapore given its lack of strategic depth and reliance on technology as a force multiplier. There are some added considerations that encourage Singapore's investment in C4ISR rather than offensive capabilities: for one, acquiring certain capabilities could upset the regional balance of power, and hence prove counterproductive. For another, its small size relative to the United States means that it cannot collaborate meaningfully on larger, more expensive platforms. Combined, these mean that its contribution will likely skew toward the niche and defensive, but there remains plenty of room, particularly in C4ISR for such collaboration.

On defense technology, the two countries can consider investing in:

a. *Unmanned Systems.* Singapore's demographic decline—by 2030, it expects its annual number of conscripts to plummet to two-thirds from the late 2010s—means that unmanned systems are integral to its future defense planning, as a way to supplant its manpower shortfall.[71] It already has about 100 unarmed UAVs used for ISR but is considering renewing this aging fleet.[72] As it does so, it could consider working with the United States to investigate ways to harden unmanned systems against kinetic attacks and electronic warfare and possibly invest more in USVs and UUVs.

b. *Swarm Technology for ISR.* Rather than hardening expensive unmanned systems, one alternative that the United States and Singapore could pursue is swarm technology: that is, the deployment of multiple, individually inexpensive drones that work in tandem. As swarm technology has applications in disaster relief, the United States and Singapore could readily investigate it as part of their existing collaboration on AI for HA/DR. The lower cost of such drones may also make an investment in swarm technology better suited to Singapore's domestic defense industry.

c. *Anti-Drone Measures.* On the flip side, low-cost drones could also be used to gather intelligence on the United States or Singapore, as is already suspected to be happening with a series of alleged 'UFO' sightings near U.S. bases.[73] Swarms of such drones could even be used offensively against high-value assets in ways that would be costly or difficult to neutralize.[74] The two countries should hence collaborate on anti-drone technologies for both peacetime and wartime use. While kinetic weapons may be feasible in wartime, the risk of collateral damage means that in peacetime, the use of other tools, such as electromagnetic jamming, is preferable.

d. *Maritime Surveillance and Reconnaissance.* Though the rise of land-based hybrid warfare is well established, another prospect that the United States may want to guard against is the prospect of 'maritime hybrid warfare'—the disruption of maritime activities with deniable forces.[75] Singapore, being dependent on sea-lines of communication, shares these concerns if in a more general sense.[76] The difficulty of deterring such attacks makes it important to rapidly identify them with both onshore and offshore systems, so that they can be responded to in a timely fashion.[77]

e. *Data Fusion for Command and Control.* Data generated by ISR assets and other sensor instrumentation can be overwhelmingly heterogeneous, and requires processing to be useful for decision-making. Both the United States and Singapore are developing tools to integrate and interpret this data. The stated intent of the United States is to use AI to fuse disparate data sources into a 'common operating picture' for commanders.[78] Where possible, the two countries can pursue further collaboration on this front.

Cybersecurity

In cybersecurity, the United States and Singapore should bolster their defenses against advanced state actors, while also strengthening their societies and ASEAN member-states in general against financially motivated cybercriminals. To insulate themselves from nation-state actors, they need not explicitly identify their major concerns: rather, they can take measures to improve security in sectors that nation-states will likely target, warding against attack vectors that nation-states will likely use. At the same time, both countries should build on the work laid out in the 2016 MOU and their prior agreements on ASEAN-wide capacity building to increase the resilience of their respective countries and Southeast Asia as a whole.

Possible areas for cooperation include:

[70] Green, Michael, et al., *Asia-Pacific Rebalance 2025: Capabilities, Presence, and Partnerships* (Center for Strategic and International Studies, 2016).
[71] Koh, Eng Beng, "Preparing a Stout Defence for Generations to Come," *Pioneer Magazine*, August 1, 2019, https://www.mindef.gov.sg/web/portal/pioneer/article/feature-article-detail/ops-and-training/2019-Q3/aug19_fs1.
[72] Currently, Singapore's two largest platforms are the Israeli-made Hermes 450 and Heron 1 UAVs. Barry Desker and Richard A. Bitzinger, "Proliferated Drones: A Perspective on Singapore" (Center for a New American Security, June 2016), http://drones.cnas.org/reports/a-perspective-on-singapore/. Min Zhang Lim, "RSAF Tracking Developments in Drone Technology," *The Straits Times*, February 15, 2020, https://www.straitstimes.com/singapore/rsaf-tracking-developments-in-drone-technology.
[73] Rogoway, Tyler. "Adversary Drones Are Spying On The U.S. And The Pentagon Acts Like They're UFOs," *The Drive*, April 15, 2021, https://www.thedrive.com/the-war-zone/40054/adversary-drones-are-spying-on-the-u-s-and-the-pentagon-acts-like-theyre-ufos.
[74] Kuzma, Richard. "The Navy Littorally Has a Drone Problem," *War on the Rocks*, October 25, 2016, https://warontherocks.com/2016/10/the-navy-litorally-has-a-drone-problem/.
[75] Stavridis, James. "Maritime Hybrid Warfare Is Coming," *Proceedings, U.S. Naval Institute*, December 1, 2016, https://www.usni.org/magazines/proceedings/2016/december/maritime-hybrid-warfare-coming. Chris Kremidas-Courtney, "Countering Hybrid Threats in the Maritime Environment," *The Maritime Executive*, June 11, 2018, https://www.maritime-executive.com/editorials/countering-hybrid-threats-in-the-maritime-environment.
[76] Ang, Bertram Chun Hou. "Hybrid Warfare - A Low-Cost, High-Returns Threat to Singapore as a Maritime Nation," *Pointer, Journal of the Singapore Armed Forces* 44, no. 4 (2018): 26–37.
[77] Hawken, Colum. "Q-Boats and Chaos: Hybrid War on the High Seas," *RealClearDefense*, December 7, 2017, https://www.realcleardefense.com/articles/2017/12/07/q-boats_and_chaos_hybrid_war_on_the_high_seas_112748-full.html.
[78] Sayler, Kelley M. "Artificial Intelligence and National Security" (U.S. Congressional Research Service, November 10, 2020), https://fas.org/sgp/crs/natsec/R45178.pdf.

a. *Supply Chain Security.* As demonstrated by Sunburst, software supply chain attacks—e.g., insertion of malicious code into third-party software updates—are particularly attractive to nation-state actors, as the large 'blast radius' of such attacks enables a well-resourced actor to compromise a large number of targets in a cost-effective way.[79] Though it can be more difficult to compromise a 'linchpin' third-party software vendor, the trust placed in such vendors makes such attacks difficult to guard against for downstream users. The United States and Singapore can jointly develop frameworks to manage software supply chain risks, taking inspiration from Singapore's scheme (announced early 2021) to incentivize critical infrastructure providers to do so.[80]
b. *Maritime Cybersecurity Exercises.* In select industries where cybersecurity incidents could have transnational impacts and be geopolitically motivated, the two countries should conduct joint exercises and develop a playbook for a bilateral response, or even a multilateral one if they included other ASEAN countries.[81] One prime candidate is the maritime sector, which could become a target for nation-state actors due to geopolitical reasons, but lags other sectors, such as the financial sector, in terms of cybersecurity practices and resources.[82]
c. *Operational Technology Security.* Operational technology (OT) and information technology (IT) are typically contrasted because the former is used in industrial operations and the latter in an administrative context. OT's industrial role means that OT cyber incidents can have a physical impact, such as manufacturing disruptions or even loss of life.[83] From the geopolitical perspective, OT systems can therefore be attractive targets. In recent years, the increasing number of OT attacks has been further exacerbated by a growing tendency to connect OT systems to Internet-facing systems and networks.[84] The potential high impact of such incidents means that Singapore and the United States should share best practices on classifying and managing OT systems, particularly as the OT vs. IT line continues to blur.
d. *Regional Capacity Building.* The United States and Singapore should continue building ASEAN's cybersecurity capacity through the TCTP and related programs, and expand these if possible. In addition, the United States can support the ASEAN-Singapore Cyber Center of Excellence by lending expertise, or possibly even with financial contributions. Where possible, both countries should engage other ASEAN countries in their other bilateral efforts, such as on software supply chain security.

Biosecurity

As one Singaporean participant mentioned in the 2014 U.S.-Singapore CHS dialogue, 'a chain is only as strong as its weakest link,' and biosecurity in the two countries depends heavily on other weak links they may be connected to.[85] Capacity building to boost regional pandemic preparedness in Southeast Asia should hence be the key focus of U.S.-Singapore cooperation on biosecurity. To enable the timely detection of new EIDs, the two countries should invest in both technical and human resources to build up regional epidemiological surveillance networks. At the same time, as both countries position themselves to participate in the synthetic biology economy, they should prioritize biosafety regulations.

Possible areas for cooperation include:

a. *Technology for Rapid Testing and Reporting.* Rapid diagnostic test kits, which provide on-the-spot results without samples being sent to a lab, are useful for epidemiological surveillance in lower-income countries.[86] However, many such tests are lower in accuracy and are no substitute for lab diagnostics.[87] Singapore and the United States could fund the development of high-accuracy point-of-care diagnostic tests for use in Southeast Asia, as private sector companies have limited incentive to develop such tests otherwise. They should also invest in tools that can integrate this decentralized test data for better decision-making during rapidly evolving outbreaks.[88]
b. *Knowledge Exchange for Epidemiological Surveillance.* However, technology alone does not guarantee effective epidemiological surveillance in the whole Southeast Asia. Political and economic factors can hamper the work of local professionals or deter them entirely, creating a manpower shortage.[89] Many such factors are domestic, and hence beyond the power of external parties to address. Still, the United States and Singapore should continue existing training programs like the TCTP and build Singapore into a hub for regional knowledge exchange. In parallel with the ASEAN-Singapore Cybersecurity Center of Excellence, Singapore could consider establishing

[79] Herr, Trey, et al., "Breaking Trust: Shades of Crisis across an Insecure Software Supply Chain" (Atlantic Council, July 26, 2020), https://www.atlanticcouncil.org/in-depth-research-reports/report/breaking-trust-shades-of-crisis-across-an-insecure-software-supply-chain/. While a full discussion of software supply chain security is beyond the scope of this paper, the Herr et al. (2020) report provides several excellent recommendations on this topic.
[80] Chee, Kenny. "Push to Better Manage Cyber-Security Risks in Critical Infrastructure," *The Straits Times*, March 3, 2021, https://www.straitstimes.com/singapore/push-to-better-manage-cyber-security-risks-in-critical-infrastructure.
[81] Manantan, Mark and Eugenio Benincasa, "U.S.-Singapore Cyber & Tech Security Virtual Series Session #4: U.S.-Singapore Perspectives on Enhancing Critical National Infrastructure Cybersecurity," *Pacific Forum* (blog), February 4, 2021, https://pacforum.org/events/us-sg-cybertech-4.
[82] Burlend, William and Jack David, "'Resilient Seas' - Cyber Security Threats to the Maritime Industry," *PricewaterhouseCoopers* (blog), January 20, 2020, https://pwc.blogs.com/cyber_security_updates/2020/01/resilient-seas-cyber-security-threats-to-the-maritime-industry.html.
[83] Lakhani, Aamir. "Evolution of Cyber Threats in OT Environments," *Fortinet* (blog), June 11, 2020, https://www.fortinet.com/blog/industry-trends/evolution-of-cyber-threats-in-ot-environments.html.
[84] "Singapore's Operational Technology Cybersecurity Masterplan 2019" (Cyber Security Agency of Singapore, October 2019), https://www.csa.gov.sg/news/publications/ot-cybersecurity-masterplan.
[85] Gronvall, et al., "Singapore-U.S. Strategic Dialogue on Biosecurity."
[86] Kozel, Thomas R. and Amanda R. Burnham-Marusich, "Point-of-Care Testing for Infectious Diseases: Past, Present, and Future," *Journal of Clinical Microbiology* 55, no. 8 (August 1, 2017): 2313–20, https://doi.org/10.1128/JCM.00476-17.
[87] Tan, Audrey. "Rapid Covid-19 Test Kits Not Used in Singapore as They Can Miss True Cases," *The Straits Times*, September 18, 2020, https://www.straitstimes.com/singapore/health/rapid-test-kits-not-used-here-as-they-can-miss-true-cases.
[88] Ming, Damien, et al., "Connectivity of Rapid-Testing Diagnostics and Surveillance of Infectious Diseases," *Bulletin of the World Health Organization* 97, no. 3 (March 1, 2019): 242–44, https://doi.org/10.2471/BLT.18.219691.
[89] Ear, "Emerging Infectious Disease Surveillance in Southeast Asia."

a similar regional 'center of excellence' for biosecurity, bringing together its maritime neighbors to complement the existing Mekong Basin Disease Surveillance Network.

c. *Journalism Fellowship Program.* The spread of misinformation during Covid-19 shows that effective risk communication is vital to pandemic management. To improve this, Singaporean and U.S. stakeholders could jointly launch a health journalism fellowship in Southeast Asia, to help participants build a network of scientific and professional resources that they can tap into their work. There are existing analogs for this: in Singapore, the Temasek Foundation and Institute of Policy Studies run an 'Asia Journalism Fellowship,' while the East-West Center, Stimson Center, and Internews Earth Journalism Network jointly run a 'Mekong Data-Journalism Fellowship.'[90]
d. *Biosafety Regulations in Synthetic Biology.* Singapore has a reputation for regulatory innovation, being willing to work closely with industry and being agile due to its size. As it invests in synthetic biology, it could coordinate with U.S. agencies to explore current proposals for improving biosafety in synthetic biology, such as mandatory screening for third-party DNA synthesis, which has not been implemented at the federal level in the United States. This could facilitate fine-tuning of innovative regulatory proposals, balancing biosafety and innovation, that could in the future be implemented at the state or federal level in the United States.

[90] Temasek Foundation and Institute of Policy Studies. "Overview," Asia Journalism Fellowship, May 21, 2015, https://www.ajf.sg/overview/. Katie Bartels, "Mekong Data-Journalism Fellowship," East-West Center, March 21, 2019, https://www.eastwestcenter.org/professional-development/mekong-journalism-reporting-fellowship.

3

Early-stage defense diplomacy: leveraging U.S.-Singapore startup ecosystems

Matthew Merighi

Abstract

Defense technology cooperation is a central pillar in the Singapore-U.S. security relationship. For 55 years, government-led collaboration initiatives fueled technological superiority that forms the core of both countries' military edge. But the private sector, driven by capital markets and an exponential increase in the power of venture capital, is reshaping how the most advanced technologies are developed. Bilateral defense technology cooperation must evolve with the times and embrace this new frontier of technology. Singapore and the United States can leverage a whole-of-society approach to channel startups as a new source of defense technology cooperation and defense diplomacy connections.

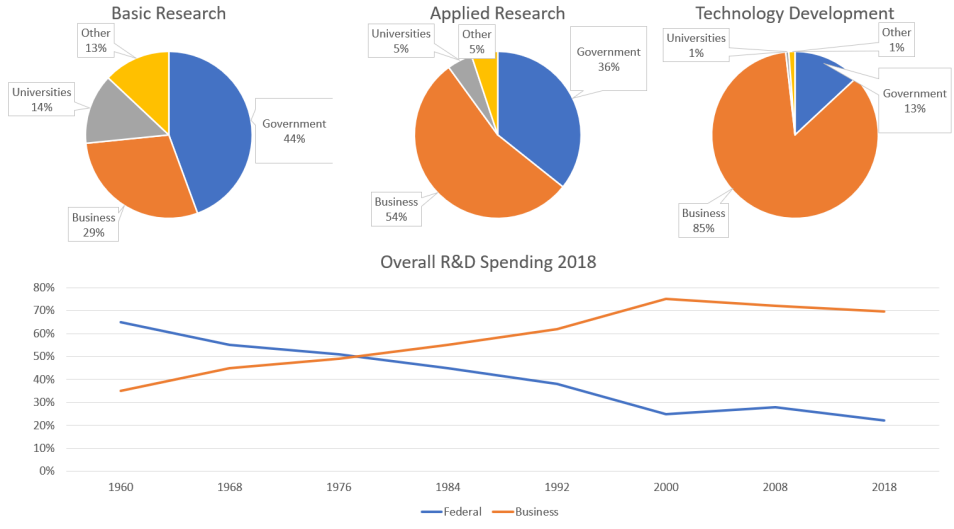
This paper examines the dynamics which make startup outreach an essential facet of defense technology competitiveness, analyzes both countries' related core competencies, and identifies areas of mutual benefit. It considers the perspective of startup entrepreneurs for Singapore and the United States to better create systems that are responsive to startup ventures. Finally, this paper prescribes specific recommendations for Singapore and the United States to build on the past 55 years and take defense technology cooperation to the next level.

Defense technology cooperation: importance and changing context

Defense technology cooperation is a central pillar in the Singapore-U.S. security relationship. For 55 years, government-led collaboration fueled the technological superiority which forms the core of both countries' military edge. Joint research programs, co-development of technology, and large-scale defense acquisitions fostered both technological progress and a spirit of trust between both sides. The fruits of these labors were visible in Singapore's armed forces. The Republic of Singapore Air Force flies American-made jet fighters and transport aircraft, tailored to the unique requirements requested by Singapore. Singapore and the United States reaffirmed this commitment during the 11th Singapore-U.S. Strategic Security Policy Dialogue in September 2020, signaling that defense technology cooperation will remain an enduring part of their security cooperation.[1]

Over the past 55 years, the landscape of technology development has shifted profoundly. From the late 1970s, privately funded research and development (R&D) in the United States, once a backwater, overtook those funded by the Federal Government. Today, 78% of all R&D spending comes from outside the Federal Government.[2] The Government holds its own on basic research funding (44%) and applied research (36%) but proved abysmal in technology development (13%). The private sector and universities were strong in basic research (43%) but dominant in applied research (59%) and technology development (86%). Department of Defense funding (via DARPA) may have created the foundations of the Internet, but private companies are the ones that shaped the Internet as we know it today.

Figure 1: Federal and private funding of R&D



Data from National Science Foundation

This gap in applied research and technology development is reflected in the formal government-to-government defense cooperation programs. Singapore and the United States have strong defense research relationships through the International Armaments Cooperation program, connecting U.S. national laboratories with foreign researchers to advance basic research. The United States' defense technology organizations in the region, such as the U.S. Army's Combat Capabilities Development Command (DEVCOM) Pacific and the Air Force's Asian Office of Aerospace Research and Development (AOARD), primarily sponsor basic research and do limited co-development of technologies. While these are important activities for the bilateral defense relationship and lay the foundations for excellent developments in the future, basic research does not generate products on its own; they need to benefit from development activities to bring their findings to life. The Government's smaller portion of overall technology development spending, and checkered history with creating field-ready technologies on its own, means that this research funding cannot reach its full potential without outside assistance.[3]

Dual-use: an old approach with new relevance

Defense technology is too often viewed as consisting of weapons. The needs of the Singapore Armed Forces (SAF) and U.S. military go far beyond those 'kinetic' technologies upon which most people fixate. Militaries are prolific users of software, consumers of food, and buyers of clothing. They are real estate developers and landlords through the military bases they manage. They are masters of global supply chains and can move equipment to and from some of the most remote places on Earth.

It is easy to see then that defense technology can include technologies that excite other industries. Improving human performance is just as valuable for soldiers as it is for professional athletes. Advanced batteries are useful to electric vehicles, regardless of whether the driver is wearing a military uniform or business suit. Medical technology can help the wounded on the battlefield or in hospitals. People in the defense profession call these technologies 'dual-use' because they have applications in the dual realms of military and civilian.

The dual-use concept is longstanding. U.S. Secretary of Defense William Cohen leaned into the idea of leveraging commercial technologies in the 1990s as a method of reducing military budgets. It is a category of technology that is notably regulated by the Department of Commerce in the United States, rather than the Department of Defense.

[1] "Singapore and the US Strengthen Defence Relations through Strategic Security Policy Dialogue", Singapore Ministry of Defense, 16 September 2020, https://www.mindef.gov.sg/web/portal/mindef/news-and-events/latest-releases/article-detail/2020/September/16sep20_nr

[2] "National Patterns of R&D Resources: 2017–18 Data Update", National Science Foundation, 8 January 2020, https://ncses.nsf.gov/pubs/nsf20307#data-tables&general-notes

[3] Barnett, Jackson. "The Pentagon is Failing to Scale Emerging Technology, Senior Leaders Say", FedScoop, 7 August 2020, https://www.fedscoop.com/dod-innovation-emerging-technology-acquisition-aspen-security-sumit/

There are many categories where technologies can meet both military and civilian needs. Below is not a conclusive list (further illustrated in figure 2 on p. 23):

- Cybersecurity: Commercial and military networks are both at risk from malicious activity.
- Artificial Intelligence/Machine Learning (AI/ML): AI/ML is disrupting all industries because automated computing power can generate insights more quickly than humans can on their own.
- Autonomy and robotics: the proliferation of small drones transforms everything from how militaries gather intelligence to how Hollywood films are shot.
- Predictive maintenance: using software to predict when expensive machines will break down is just as useful for military vehicles as it is for commercial airplanes and construction vehicles.
- Advanced manufacturing/3D printing: automated printing can change the calculus on personalized item design while also transforming how military units can get spare parts in remote environments.
- Computer Vision: advanced analytics and computer-generated imagery can predict potential terrorist threats through behavior analysis and can also detect shoplifters.
- Artificial reality/virtual reality (AR/VR): the line between commercial video game technology and military simulations is growing thinner by the day.[4]
- Medical technology: militaries are often the largest healthcare providers in the world. Trauma surgeons and field medics fulfill the same role in different contexts.
- Biotechnology: COVID19 has laid bare the need for all segments of society to improve their access to cutting-edge biotech.
- Materials: advanced materials are the heart of many industries. From the ages of iron and steel to the development of the fiberoptic cables that house the Internet, physical materials are crucial to both the military and civilian sectors.
- Human performance: whether through advanced nutrition or supplementary equipment, both the military and sports teams have a similar need to ensure their personnel have every possible edge over their competitors.
- Energy: access to affordable, reliable energy is an existential need for all militaries and most civilian industries.
- Communications: communications are the bedrock of operations for both the commercial and military sectors. Either category will be left behind by its competitors without fast, effective communications.
- Quantum computing is the underlying technology that fuels the development of AI/ML and computer vision.
- Maritime technologies (Bluetech): the technology needs of commercial and military ships, such as navigation, are more alike than different.

A crucial insight emerges from this list–they mostly fall under a category of technology called 'deep tech.'[5] A dictionary definition of deep tech is elusive, but it commonly refers to technologies not focused on end-user services[6]. These technologies require deep foundational research and substantial investment.[7]. Deep tech startups often find it difficult to obtain funding from the private sector because of higher development costs. Governments should therefore fund them alongside private investors.

But pursuing dual-use opportunities is not a cure-all. Military and civilian uses of technology can be similar on the surface but diverge widely at implementation. The average military satellite needs to be hardened against physical and electronic attacks. Most civilian clothing does not need to be flame retardant. Food packaging does not need to stay shelf-stable for three years in hot and cold climates. This is the problem of 'ruggedization,' where military equipment often needs to be held to a higher specification and thus drives much higher development costs. Startups are unlikely to make these investments, especially if the commercial market is more lucrative with a less expensive product.[8]

Leveraging dual-use technology, then, is not only about identifying areas of common interest between the military and civilian sectors: it requires a deeper examination of the technology development to ensure that the companies producing that technology can satisfy both sides' needs with minimal reengineering.

Dual-use in national policies

The dual-use approach is more than financial expediency: it is a natural fit for the defense concepts of both Singapore and the United States.

In Singapore, the Government is looking for new ways to bring all of society together for national defense. During the March Ministry of Supply debates, Senior Minister of State for Defense Zaqy Mohamad spoke about the SAF's 'Total Defense' concept, with 'the pillars of the military, civil, economic, social, psychological and digital defense all working in concert.'[9] The Next-Generation SAF concept places a premium on high-quality sensors, pre-emptive maintenance, data analytics, AI, and other areas in the earlier list.[10]

Beyond defense, startup ecosystems loom large in commercial policy as well. The Prime Minister's 2021 budget speech prioritized support for Singapore's entrepreneurs to maintain the country's international

[4] Kuhn, Scott. "Soldiers Maintain Readiness Playing Video Games", U.S. Army, 29 April 2020, https://www.army.mil/article/235085/soldiers_maintain_readiness_playing_video_games

[5] Also interchangeably referred to as "tough tech". Deep tech will be used for the purpose of this monograph.

[6] Lunden, Ingrid. "What Do We Mean When We Talk About Deep Tech?", TechCrunch, 11 March 2020, https://techcrunch.com/2020/03/11/what-do-we-mean-when-we-talk-about-deep-tech/

[7] "What is Different About Deep Tech Startups?", Martin Trust Center for MIT Entrepreneurship, access 12 June 2021, https://orbit-kb.mit.edu/hc/en-us/articles/115000815511-What-is-different-about-deep-tech-startups-

[8] Aitoro, Jill. "Silicon Valley Investors to DoD: Dual-Use Tech is a Bad Strategy", C4ISRNET, 30 January 2020, https://www.c4isrnet.com/smr/cultural-clash/2020/01/30/silicon-valley-investors-to-dod-dual-use-tech-is-a-bad-strategy/

[9] "Speech by Senior Minister of State for Defence, Mr Zaqy Mohamad, at the Committee of Supply Debates 2021", Singapore Ministry of Defense, 1 March 2021, https://www.mindef.gov.sg/web/portal/mindef/news-and-events/latest-releases/article-detail/2021/March/01mar21_speech3

[10] Chan, Samuel. "Developing Singapore's Next-Generation Military", East Asia Forum, 2 January 2021, https://www.eastasiaforum.org/2021/01/02/developing-singapores-next-generation-military/

competitiveness. It featured a Corporate Venture Launchpad to increase the number of tech spinouts, the Venture Debt program to help venture capital investors, and an expanded Enterprise Singapore Global Innovation Alliance to onshore more international entrepreneurial ventures.[11] The speech also included initiatives that are valuable for the dual-use sector without being immediately apparent. The Singapore Green 2030 Plan is the marquis environmental legislation for the country. Part of the initiative includes support for electric vehicle (EV) developments. Militaries are also interested in EVs to reduce reliance on fossil fuels and remove the complex supply chains necessary to move fuel.

The U.S. DoD is making substantial investments in its own dual-use innovation ecosystem. These initiatives include establishing new organizations to catalyze dual-use startup developments, such as the National Security Innovation Network (NSIN) and the Defense Innovation Unit (DIU), and the radical transformation of the Small Business Innovation Research (SBIR) program to shift towards funding commercial startups. Time will tell how the Biden Administration will guide these programs. But these initiatives are broadly popular and bipartisan, having begun first at the tail-end of the Obama Administration, continued during the Trump Administration, and supported by Congress throughout. On the economic policy front, Biden's Secretary of Commerce is a former venture capitalist (VC) herself, [12] likely indicating continued support for startups in policy.

Firstly, Singapore and the United States have strong startup ecosystems for producing deep tech. They have strong education systems which generate the technical and business talent needed for complex technologies. They have strong programs which support companies at different stages, ranging from incubators for new ideas, accelerators for ideas to mature, and early-stage capital from angels and VCs to scale new ideas.[14] In places where the private market falls short on deep tech, both countries have government programs to fill the gaps. Both countries have conducive business environments, an enthusiastic embrace of entrepreneurs, and a solid commitment to intellectual property. They share a common business language in English.

Singapore brings its advantageous geographic location and robust government programs to dual-use technology collaboration. Singapore markets itself as a gateway to markets in Southeast Asia. The region is home to over 640 million people, nearly double the population of the United States, half of which is in the highly coveted under-30 market[15]. Its investment climate is unique in the region, offering a safe harbor with a strong support network just as it did in the era of Stamford Raffles. Singapore itself is a strong, albeit small, market where companies can test ideas before preparing them for export to larger countries in the region. [16] Singapore has Government support programs for startups like the United States, but the programs' sophistication and efficiency mirror those found in other sectors.

"A Singaporean startup that has successfully grown its technology through the local ecosystem can then establish a foothold in the United States to scale. For American startups that already have traction in their local market, expanding to Singapore offers the chance to use its efficient pipeline to develop a presence in the wider Southeast Asia."

Competitive Advantages, Mutual Benefits

Singapore and the United States have built 55 years of cooperation based on common interests and shared values. The economic dimensions of this cooperation continue to expand, such as through the December 2020 MOU on Trade Financing and Investment Cooperation. [13] But collaborative programs are only successful if each party brings something of value to the other. It might be difficult for an outside market observer to see the mutual benefits for countries so disparate in size. But both Singapore and the United States have common strengths and unique advantages in dual-use technology development which complement those of the other.

To the savvy dual-use startup observers, the geography point can seem simplistic. Deciding to enter another market takes a lot of time, particularly in regional economies, requiring extensive business development to make inroads with buyers. This is doubly true for militaries which are already a difficult market to sell to without the added burdens of language and cultural differences.[17] But this remains a competitive advantage that the dual-use startups should care about. The region is still home to substantial B2B opportunities for large companies whose regional headquarters are in Singapore for the same reasons. [18] Furthermore, the commercial dimensions of dual-use technology can still be relevant for those consumer markets in Southeast Asia. The military markets

[11] "Budget 2021: Emerging Stronger Together", Singapore Ministry of Finance, accessed 12 June 2021, https://www.mof.gov.sg/docs/librariesprovider3/budget2021/download/pdf/fy2021_budget_statement.pdf, pages 12-15

[12] "Former VC Gina Raimondo set to run Commerce Department", PitchBook, 8 January 2021, https://pitchbook.com/newsletter/former-vc-gina-raimondo-set-to-run-commerce-department-jpE

[13] "United States Secretary of Commerce Wilbur Ross and Singapore Minister For Trade And Industry Chan Chun Sing Sign Memorandum Of Understanding On Trade Financing And Investment Cooperation", Singapore Ministry of Trade and Industry, 16 December 2020, https://www.mti.gov.sg/-/media/MTI/Newsroom/Press-Releases/2020/12/Press-release-on-signing-of-MOU-on-trade-financing-and-investment-cooperation-between-SG-and-US.pdf

[14] "The Global Startup Ecosystem Report: Rankings 2020: Top 30 + Runners-Up", Startup Genome, accessed 12 June 2021, https://startupgenome.com/article/rankings-top-40

[15] Quek, Christopher. "Beyond the Valley: Why Tech Entrepreneurs Should Look East", Singapore Economic Development Board, 27 May 2019, https://www.edb.gov.sg/en/business-insights/insights/beyond-the-valley-why-tech-entrepreneurs-should-look-east.html

[16] Singapore is a good testbed for technologies looking to enter Southeast Asian markets because of its strong business culture and the granting of approvals for experimental technologies. An example can be found in the autonomous car company, NuTonomy, which received approvals to test its vehicles in Singapore as far back as 2016. Asma Khalid, "Why Singapore Is A Key Part Of NuTonomy's Strategy For Driverless Cars", WBUR, 25 October 2017, https://www.wbur.org/bostonomix/2017/10/25/delphi-purchase-nutonomy

[17] Militaries are difficult markets to sell to since they have complex acquisition processes and are used to bespoke creation of products for their needs.

[18] B2B means "business-to-business", a type of startup business model which focuses on selling to businesses rather than directly to consumers. In

can then be engaged either once the startup can invest in business development or as a subcontractor to larger defense primes.

The United States brings its large size and immense investing ecosystem. It has the largest economy and the third-largest population globally, making it a valuable consumer and B2B market without the downsides of the fragmentation found in viewing Southeast Asia as a single market. It also brings its unique angel investment and venture capital ecosystem to bear. While Singapore's ecosystem is robust, it is constrained by its size and options. Entrepreneurs are used to contacting an average of 100 or more VCs as part of a successful fundraising round.[19] This is not possible in Singapore, which has excellent VC funds but too few for most startups to find the right match.

How can this new dual-use ecosystem leverage these comparative strengths? That depends on the origin of the startup. A Singaporean startup that has successfully grown its technology through the local ecosystem can then establish a foothold in the United States to scale. For American startups that already have traction in their local market, expanding to Singapore offers the chance to use its efficient pipeline to develop a presence in the wider Southeast Asia.

The startup's perspective: time is money, and money is limited

This paper has discussed governments' interest in dual-use and the favorable macroeconomic conditions for startup development. But it is important to understand the startups' perspective and how they make decisions within these systems to optimize design.

As discussed briefly in Section III, the most critical variable that startups manage is time, which is intrinsically linked to money. Startups operate similarly: a group of founders volunteers their time to develop a concept and gain some initial traction. Using that traction, they sell off a percentage of their company to raise money from angel investors to further develop their idea through purchasing materials and hiring personnel. Once that is accomplished, they will then sell a larger percentage of their company for even more money to VCs to scale their idea and expand their market.

At each of those stages, the main enemy is time.[20] The longer it takes to develop the product and start making traction, the greater the chance that the company will run out of money to build the product and pay the workers. Raising money from angels and VCs is heavily reliant on trust.[21] If you have wasted time and money you already have, it becomes much harder to raise additional capital (and buy extra time) in the future.

Each decision to develop a product or enter a new market is about how to use limited time. So, the virtue of a decent opportunity is not enough to sway a startup's decision on its own. From the startup's perspective, the opportunity cost of pursuing a decent opportunity at the expense of a great opportunity is a big problem.

This structural dynamic inhibits dual-use companies even in a single-country context. Civilian and military markets have distinct differences, even if their product needs can be pretty similar. Successfully executing a dual-use approach requires focusing on areas where the product needs between the two sides are at their most similar to prevent expensive and time-consuming re-engineering. The founding team needs also to have a familiarity with both markets to minimize the amount of learning, thus saving precious time in the company's life.

Labs' intellectual property: a hidden weapon in the tech development arsenal

Dual-use startups begin with a technology that needs to be developed. The most common vision for a startup is one where the company founders develop a technology themselves, a romantic notion of tinkerers in garages, like how Microsoft and Apple were in their early days. But often, successful technology companies spring forth from research labs with the funding and equipment needed to develop deep tech. It is common for students coming out of universities to build a company around their academic research.[22] There is even a certain category of company, called technology discovery companies, which review universities' intellectual property (IP) to find promising business prospects. To this mix is a technology sector often overlooked: the IP coming out of national defense labs.

In Singapore, the Defense Science Organization (DSO) is the main source of defense lab technology. As part of the Defense Technology Community, the DSO is responsible for generating raw technology development for event testing and evaluation and commercializing technology through A*STAR.[23] The United States has 43 defense laboratories and nine federally funded research and development centers (FFRDC's) which generate IP. At the defense laboratories alone, there are 5,277 technologies available for licensing.[24]

"This pre-validated market need within the defense sector is a good signal to startups that at least half of the dual-use market analysis has already been done; all that remains is validating the commercial market to see if there is true dual-use potential."

These technologies are important for generating new dual-use technology companies for two reasons. The first is validation. The technologies developed by national labs are funded by public funds. Therefore, at some point

the dual-use sector, this is often the most relevant analog to the dynamics in selling to a government.

[19] Crichton, Danny. "DocSend's New Pre-Seed Data Shows How Many Founders You Should Have and How Many Investors You Should Meet", TechCrunch, 3 March 2020, https://techcrunch.com/2020/03/03/docsends-new-pre-seed-data-shows-how-many-founders-you-should-have-and-how-many-investors-you-should-meet/

[20] Tunguz, Tomasz. "The Importance of Time Value of Money for Startups", Yahoo! Finance, 5 April 2018, https://yhoo.it/3gxreLw

[21] Joeveer, Mamie. "Why Mutual Trust Matters in Investor-Startup Relationships," Forbes, 25 March 2014, https://www.forbes.com/sites/groupthink/2014/03/25/why-mutual-trust-matters-in-investor-startup-relationships/?sh=3b760e02374a

[22] "A Guide to University Spinouts", Pillar VC, accesses 12 June 2021, https://www.pillar.vc/playlist/university-spinouts/

[23] "About Enterprise", A*STAR, accessed 12 June 2021, https://www.a-star.edu.sg/enterprise/

[24] "TechLink", TechLink, accessed 12 June 2021, https://techlinkcenter.org/

in the technology's development process, a buyer within the Government had to sign off that such a technology would be needed for future government acquisition. This pre-validated market need within the defense sector is a good signal to startups that at least half of the dual-use market analysis has already been done; all that remains is validating the commercial market to see if there is true dual-use potential.

Innovation: a system, not a talking point

Recognizing these trends is beneficial but insufficient. To build a system, there must be tangible activities that accelerate the development of dual-use businesses. After all, time is money, and money is limited. One of the main challenges to manage is deal flow[25]. Managing deal flow is a challenge identified by both the Singaporean and U.S. governments. The newfound enthusiasm for going after a dual-use market instead of a traditional commercial market is a welcome development that both countries embrace. But managing the second order effect of too many companies without enough time to vet them effectively has become a problem. Time, it would appear, is limited for the Government as well.

In building a system, it is also essential to save energy on inventing programs that already exist. Too often, the traditional government solution is to establish a new organization or conduct a reorganization. An alternative approach might be to network existing organizations together through new joint activities or provide a new mandate to an existing organization. But there is a catch: if the new mandate includes a completely new mission set, it might also require entirely new skillsets and/or source of human capital.

Three lines of effort emerge from this observation:

1. Connect: if organizations exist and are already fulfilling an essential role in this ecosystem, then value could be generated by connecting them to other nodes in the ecosystem and finding tangible ways for them to work together.
2. Augment: if organizations exist but lack the necessary resources or operating mandates, augment them with what they need to succeed.
3. Invent: if the existing suite of organizations lacked a key area and none of the other organizations had the suitable capacity to do so through Augmentation, then create a new organization with the right people to fill the gap in the ecosystem.

Developing an investment thesis: the technologies of interest

As highlighted earlier in this paper, militaries possess eclectic technology needs far beyond kinetic technologies. A logical conclusion could be drawn that they should then be cultivating ties to as many diverse startup sectors as possible to ensure they benefit from the broadest swathe of commercial development. But it is also true that spreading an initiative too thin is a sure way to fail in its early days. Instead, it is better to act like a startup: start small, do a good job, and scale from there.

"…it is also true that spreading an initiative too thin is a sure way to fail in its early days. Instead, it is better to act like a startup: start small, do a good job, and scale from there."

One of the counter-intuitive conclusions to draw from the earlier observation about ruggedization is that cybersecurity is not a great area to focus on at first. Commercial cyber developments are excellent, but any technology which can access privileged government networks requires approvals to operate far beyond those demanded by large corporate clients, to say nothing of the average commercial consumer. Another example is in maritime technology. There are common navigation challenges for Navy submarines and private submersible drones. But the technical information surrounding Navy submarines is some of the most classified information in the U.S. Department of Defense. This makes it difficult for a commercial Bluetech company to provide a solution for Navy submarines without going through a long and expensive background investigation process and conforming to the Navy's high standards.

Where should these collaborative activities start? Using the list put forward in Section II, we can draw a list of five which are broadly attractive to the current stream of government programs and commercial interests:

1. AI/ML: an important foundational technology attractive to both the government and commercial sectors.[26] Of note: many startups use AI/ML in their marketing without actually offering an AI/ML capability, most often just more simple analytics platforms with no long-term learning.[27] Investing in this area should be done with plenty of expert advice.
2. Advanced Manufacturing: both Singapore and the United States are making substantial public investments in advanced manufacturing. The commercial sector is also engaged in the long-term success of these technologies to make supply chains more robust, especially in another pandemic.
3. Autonomy and robotics: the software and hardware which enable machines to operate independently or in teams with humans have enough dual-use enthusiasm to make for a robust investing market.[28] Robotics as a replacement for the declining number of military personnel is a crucial element of Singapore's national defense strategy. Similarly, the United States has been pioneering robotics and autonomy since Iraqi soldiers surrendered to a spotting drone in the First Gulf War.

[25] Deal flow is a term for the parade of companies, potential "deals", which present to angels and VCs.
[26] van Attekum, Martijn, Jie Mei, and Tarry Singh, "Software Ate the World, Now AI Is Eating Software", Forbes, 29 August 2019, https://www.forbes.com/sites/cognitiveworld/2019/08/29/software-ate-the-world-now-ai-is-eating-software/?sh=238965ca5810
[27] Vincent, James. "Forty Percent of 'AI startups' in Europe Don't Actually Use AI, Claims Report", The Verge, 5 March 2019, https://www.theverge.com/2019/3/5/18251326/ai-startups-europe-fake-40-percent-mmc-report
[28] Seitz, Patrick. "Industrial Automation, Robotics Market is 'In Full Swing' Post-Covid", Investor's Business Daily, 27 May 2021, https://www.investors.com/news/technology/robotics-stocks-industrial-automation-market-is-in-full-swing/

4. Biotech/Medtech: one of the fields where the commercial and military sectors operate in a similarly structured way; their markets are heavily regulated with a small number of established companies that dominate the market through savvy navigation of those regulations. Biotech investment is more expensive than other technology sectors, providing more private investment capital for the R&D dynamics identified in Section I.
5. Human performance: a little-examined corollary to Singapore's declining national service numbers. The future of military personnel is not just about replacing people with robots; it also uses technology to improve the functions of the people who remain in uniform. On the commercial side, this sector is attracting interest because of the growing financial strength of professional sports and the explosion of the e-sports sector in the past five years.[29]

Policy proposals: building a platform

In the startup sector, platform technology is the foundation for other lines of effort. Examples of this are Windows and Apple OS, which provide the foundation for many programs and apps. This defense diplomacy initiative can benefit from the same approach. Rather than design a single, specific program for a narrow use-case, this system should be designed to scale and evolve as the dual-use market changes.

The following are specific steps through which Singapore and the United States can build a comprehensive platform to encourage more dual-use startups:

1. Create more pathways for startups to make international customer discovery: startups are in constant search of customers and looking to validate concepts before undertaking expensive engineering efforts. DSTA and OSD(R&E) can assist this effort by running programs that connect startups in the aforementioned technology areas in Section VII with their consumers in the military. It would be more effective for the SAF and DoD to inform startups of their needs jointly.
2. Create a recurring forum for government investors to manage deal flow: Singapore and the United States can adapt the best practices of VCs in managing deal flow by triaging based on their interests and establishing a network of experts to make knowledgeable triage decisions. This can include a regular meeting, done quarterly or biannually, where agencies compare notes on potential companies to aid in triage. A bullpen of subject matter experts from both countries could also be established for faster evaluation of ideas. These experts could be drawn from the existing networks built by their national research programs and U.S. DoD-funded research conducted in Singapore. Use the 'Connect, Augment, Invent' paradigm explored earlier in this monograph to investigate whether existing systems could be adapted before creating new ones. Singapore's Cap Vista investment fund would be the ideal entry point into Singapore with its dual-use investing mandate.
3. Expand Enterprise Singapore's Global Innovation Alliance (GIA) to new cities in the United States: the GIA is a system of startup outposts that Enterprise Singapore maintains in other countries and is slated for expansion in 2021.[30] This infrastructure is the natural landing point for facilitating dual-use venture's entry into the United States and finding U.S. startups with relevant technology in Singapore. Rather than create a parallel structure for dual-use companies, it would be better to augment the GIA outposts with the resources they need to represent the MINDEF's dual-use interests effectively. The GIA already operates in the world-leading innovation hub of San Francisco. For expansion to other hubs with dual-use potential, the first two target cities should be Boston, Massachusetts (for its strong biotech cluster and the deep tech which spins out of local universities) and Austin, Texas (for its robust consumer tech ecosystem and connection to Army Futures Command, a leading technology innovation organization within the U.S. DoD).
4. Amplify talent matching programs for dual-use startups: matching potential founders and partners between the two countries will directly aid defense diplomacy through Track 2 connections. For startups, this will also provide value in accessing the other country's market. Enterprise Singapore already has good talent programs through SGInnovate and other initiatives. Combined with future GIA outposts in the United States, there could be more opportunities for potential founders to find each other and build stronger networks of technical advisors.
5. Create an accelerator program for both countries' entrepreneurs to license dual-use IP from national labs: this is an adaptation and expansion of the Defense Innovation Accelerator and other startup studio programs being used in the United States to examine dual-use commercialization potential for laboratory IP.[31] Expanding this into the Singapore-U.S. context would include drawing technology from both sides' laboratories and entrepreneurs from both ecosystems. Multinational teams could also form to facilitate easier entry into both countries' defense markets.

Future vectors: an indo-pacific foundry?

This platform can evolve over time, just as technology evolves in unexpected ways. A key tenet in the Disciplined Entrepreneurship philosophy pioneered by MIT is to focus on a single line of effort, get good at it, and expand to new lines of effort once the original idea is refined and successful.[32] This same approach can work by piloting the policy proposals above. Singapore and the United States can start with a limited scope, refine it over

[29] Vasic, Luka. "Meredith McPherron: We're Still in the Early Innings of Tech's Impact on Sports", Sport Techie, 10 November 2020, https://www.sporttechie.com/meredith-mcpherron-drive-by-draftkings-venture-capital-startups-investments

[30] Lam, Fiona. "Budget 2021: New Launchpad for Innovative Ventures; Help for Global Tie-Ups", The Business Times, 16 February 2021, https://www.businesstimes.com.sg/government-economy/singapore-budget-2021/budget-2021-new-launchpad-for-innovative-ventures-help-for

[31] A startup studio program is one in which a startup is fresh formed through a structured program, often from an existing idea or piece of IP.

[32] Aulet, Bill. *Disciplined Entrepreneurship: 24 Steps to a Successful Startup* (Hoboken NJ, John Wiley & Sons Inc, 2013), 43-44.

three years, and determine what generates value before expansion.

If the pilot effort is successful, there are several ways this program could grow:

The first is to focus on new technology. The initial investment thesis can expand and include other areas of dual-use technology. Predictive maintenance, AR/VR, communications, and energy are the ones that have the broadest applicability to both the government and commercial sectors. But any of the technology areas on the list in Section II could be reasonably included.

The second is the inclusion of more countries. There are other countries in the region with which Singapore and the United States have strong security cooperation and are home to strong startup ecosystems. Australia, India, Japan, and South Korea are just some of the thriving entrepreneurial economies in the region that could supply dual-use technologies. Bringing these countries together is a noble goal but should be done so in a deliberative manner and in a way that does not disrupt the integrity of the overall system.

Regardless of how it evolves in the long-term, there is excellent short-term potential for Singapore and the United States to simultaneously advance their national security interests while also building a novel new channel for defense diplomacy. Implementing these changes will set a standard for how security relationships can operate and ensure the vitality of the Singapore-U.S. partnership for years to come.

Figure 2. Categories where technologies can meet both military and civilian needs.

Technology Area	Description	Military Example	Civilian/Commercial Example
Cybersecurity	Tools that protect computer networks	Protecting military computer networks from espionage.	Protecting corporate computer networks for ransomware.
Artificial Intelligence/Machine Learning (AI/ML)	Algorithms that learn and improve over time	Identifying potential targets more quickly	Identifying potential customers more quickly
Autonomy and robotics	Machines and independent operation from humans	Small drones to improve squad-level intelligence gathering	Small drones to shoot movies for YouTube or real estate listings
Predictive maintenance	Predicting the need for vehicle maintenance before a breakage occurs	Improving performance of military aircraft	Improving performance of construction equipment
Advanced manufacturing/3D printing	Automated printing technologies	Printing specialty parts in combat zones with limited supply chain access	Printing specialty parts to reduce overall cost
Computer Vision	The fusion of artificial intelligence with video systems to analyze the visual world	Analyzing potential human threats for military bases	Detecting shoplifters
Artificial reality/virtual reality (AR/VR)	Using video to create synthetic, life-like environments	Simulations for military training	Video games and e-sports
Medical technology	Devices for medical care	Advanced tools for combat medics	Advanced tools for trauma surgeons
Biotechnology	Using biological processes to improve human health or build new biological systems	Microbiome improvements to prevent soldiers from getting sick	Microbiome improvements to prevent children from getting sick
Materials	Using physical materials to create or improve products	Bonding agents to attach vehicle armor	Bonding agents to attach car exteriors
Human performance	Improving human physiology and cognition	Improving soldier's cognitive performance in combat	Improving athletes' cognitive performance during competitions
Energy	Finding new and more efficient sources of power	Electrifying vehicles to reduce the amount of fuel needed in combat zones	Electrifying vehicles to improve travel ranges and combat climate change
Communications	Advanced communication platforms or devices, such as 5G	Transmitting drone intelligence for analysis	Transmitting images for video conferences
Quantum computing	Using quantum mechanics to improve computing power	Improving processing power for intelligence	Improving processing power for cryptocurrency mining
Maritime technologies (bluetech)	Technologies that improve ocean voyages	Navigation for military vessels	Navigation for commercial ships

4

U.S.-Singapore relations amidst an evolving institutional landscape

Jasmine Ong

Abstract

This chapter examines the shared preferences of the United States and Singapore for multilateralism and revisits how they came to attach significant ideational value towards these institutions. Given both countries' principled approach to foreign policy, Washington and Singapore need to focus on strengthening existing rules and norms, and leverage their core competencies to sustain regional and global institutions. This paper takes stock of the current institutional landscape and makes a case for U.S.-Singapore collaboration.

Introduction

The United States is the principal architect of global political and economic institutions as we know them today. Former Secretary of State Dean Acheson wrote in his memoir, *Present at the Creation*, that in the immediate post World War II period then-President Harry S. Truman was both "willing and anxious to work with every country that wishes to enter into a cooperative system." Institutions were developed as a means for the "promotion of general welfare, insurance of domestic tranquility and provision of common defense."[1] Singapore views these very institutions, the sanctity of international law and provisions for one-state one-vote, as imperative for its survival as a small state. In addition, its early economic and social development and public service institutions were heavily influenced by technical advisory from the 'Winsemius Report,' commissioned by a United Nations agency.[2]

Taken together, this paper examines the shared preferences of the United States and Singapore for multilateralism and revisits how they came to attach significant ideational value towards these institutions. Given both countries' principled approach to foreign policy, Washington and Singapore need to focus on defending existing rules and norms, and leverage their core competencies to strengthen regional and global institutions. This paper takes stock of the current institutional landscape and makes a case for collaboration. Finally, it examines what has been done and proposes practical grounds of cooperation for this diplomatic dyad.

A large volume of literature on bilateral relations is devoted to direct defense cooperation or historical narrative to explain the entrenched role of the United States as a dialogue partner of the Association of Southeast Asian Nations (ASEAN), of which Singapore is a founding member. Much less has been written in the context of institutional cooperation. The value of this paper is, therefore, in filling this gap in understanding and its forward-looking perspective to provide actionable insights.

Shared preference for institutional cooperation

International regimes are defined here as a "set of implicit or explicit principles, norms, rules, and decision-making procedures around which actors' expectations converge," which in turn depends on the operations of 'institutions, organizations, governments, and international bodies."[3] This array of political and economic fora includes the United Nations, Bretton Woods institutions, and their specialized agencies, where both the United States and Singapore claim a certain degree of convening power. [4] Like other global actors, the two countries have engaged in multilateralism – institutionalized cooperation among multiple states and minilateralism or plurilateralism – cooperation among a smaller subset of actors. A broad focus is taken to consider both instances. Of note, the shared commitment of the United States and Singapore towards institutionalized cooperation is best demonstrated through historical accounts and consequently how these shaped perceptions towards collective action.

Longstanding support by the United States for international regimes is 'embedded in collective memories, government procedures, education systems and the rhetoric of statecraft.' Having emerged with an inordinate role post-World War II, the United States had a primary role in forging international institutions. Described as 'first citizen' of this order, the United States progressively shaped ideas from liberal democracy to liberal internationalism.[5]

Aptly described by Hillary Clinton during her appointment as Secretary of State, the three primary tools of engagement by the United States are — alliances, partnerships & multilateral institutions.[6] A leading scholar on American foreign policy and Former Assistant Secretary of Defense for International Security Affairs, Joseph Nye, reasons that "Jeffersonian respect for the opinions of humankind and Wilsonian use of institutions [had been] crucial to the success of American foreign policy."[7] He rationalizes that, while geographical size created a 'basis for American exceptionalism,'[8] it is the liberal democratic values of the United States that provide it with moral energy and legitimacy in the eyes of others. The provision of global public goods, such as 'an open international trading system, freedom of the seas and other commons, and development of international institutions...' encouraged reciprocity and cooperation with moral consequences that go beyond any single transaction.[9]

"The provision of global public goods, such as 'an open international trading system, freedom of the seas and other commons, and development of international institutions...' encouraged reciprocity and cooperation with moral consequences that go beyond any single transaction."

There are, without question, exceptions to this line of thinking, where the United States had sidestepped institutional reins and disregarded a lack of consensus from the larger international community. Often cited is the unilateral decision by the George W. Bush Administration to stake a war on terror.[10] Much more recently, under the Donald Trump Administration, the United States withdrew from several international organizations and agreements, fomenting a narrative that the United States had overextended itself in geographical areas far removed

[1] Acheson, Dean. "*Present at the creation: My years in the State Department*.", WW Norton & Company (1970): 727-749
[2] Mukherjee, Jaideep. "*UNDP and the making of Singapore's Public Service: Lessons from Albert Winsemius*", United Nations Development Programme Global Centre for Public Service Excellence (2015): 44
[3] Krasner, Stephen D., ed. "*International regimes*". Cornell University Press, 1983: 2
[4] Weiss, Thomas G., and Rorden Wilkinson. "*From International Organization To Global Governance*." Routledge, 2018: 1194-1224
[5] Ikenberry, G. John. "The End Of Liberal International Order?" *International Affairs* 94, no. 1 (2018): 7-23.
[6] Clinton, Hillary. "America's Engagement in the Asia-Pacific Region." (Speech, Honolulu, HI, October 28, 2010). U.S. Mission to ASEAN. https://asean.usmission.gov/americas-engagement-in-the-asia-pacific-region/.
[7] Nye, Joseph S. "*Do Morals Matter?: Presidents And Foreign Policy From FDR To Trump*." Oxford University Press, USA, 2019: 494
[8] Nye (2019): 22-28
[9] ibid: 434
10 Hirsh, Michael. "Bush and the World." *Foreign Affairs* (2002): 18-43.

from its domestic interests.[11] Against this backdrop, there is much apprehension among observers about sustained American leadership in the institutional order, even as the current Biden Administration has set a clear vision for America to be "at the head of the table" and lead in "catalyzing global action on shared challenges." Among Biden's first actions as the 46th President were Executive Orders to re-join the Paris Climate Agreements, [12] re-engagement with the World Health Organization,[13] and a return to the Human Rights Council as an observer,[14] in an apparent attempt to "restore the health and morale of its foreign policy institutions."[15]

Singapore's preference for institutionalism is, by contrast, deeply rooted in contingency.[16] Recognizing the high costs faced by a small state acting alone, Singapore gravitated towards harnessing the potential of joint actions. An abrupt separation from Malaysia in 1965 saw the island-state join the United Nations as its 117th member,[17] with a sense of foreboding and great urgency to establish sovereign credentials, as numerous countries delayed recognition of this newly independent Republic.[18] Senior diplomats ascribed the underlying need to be 'at the table,' towards cognizance of its size constraints and how it could ill afford to be in an international arena where 'might makes right.'[19] This line of thinking became ingrained and just about "axiomatic…that a world governed by international law and multilateral organizations like the UN was in the fundamental interests of small countries like Singapore."[20]

"…some analyses often describe Singapore as punching above its weight and playing an outsized role in the international arena. More definitively, Singapore spearheads technical cooperation in what might be viewed as a constructive and virtuous cycle."

Immediate threats from Communist insurgencies in Southeast Asia in the late 1960s also meant that Singapore's foreign policymakers had not found it "difficult to reconcile their national interests with regional cooperation,"[21] which led to its joining the ASEAN. In 1992, considering the overlapping claims in the South China Sea, Singapore, as chair of the ASEAN standing committee, promoted the involvement of major powers into what was to become the ASEAN Regional Forum (ARF). Singapore found it pertinent to engage the United States as a quintessential balancer in the region.[22]

Singapore also actively seeks to secure its political, economic, and security interests through outreach beyond the immediate neighborhood. As Tommy Koh, former Ambassador of Singapore to the United Nations, puts it, "performing mediatory roles within international institutions earns reciprocal goodwill for the future." [23] Though there are few writings on Singapore within regional and international fora, [24] some analyses often describe Singapore as punching above its weight and playing an outsized role in the international arena.[25] More definitively, Singapore spearheads technical cooperation in what might be viewed as a constructive and virtuous cycle. This may be attributed to its early nation-building experiences, where the United Nations Development Programme, as described by its first Prime Minister Lee Kuan Yew, had played a very important role in establishing Singapore, providing technical knowledge and professional fellowships to many who would subsequently take up key leadership positions in Singapore.[26]

Shifts in institutional landscape and the case for partnership

For decades, the United States has been at the center of a large and expanding institutional order. However, questions have been raised about its staying power and preponderance in the security and global governance agendas.

A view from John Mearsheimer, for instance, draws a parallel between challenges to America's primacy as the provider of security guarantees and the institutional order. He contends that the liberal world order will visibly lose relevance because it is fundamentally premised on U.S. predominance and the ability to set rules. [27] The disproportionate cost of maintaining its forward-deployed troops and bases, together with its adversaries' growing influence and technological advances, has cast doubts about that.

While Singapore cannot tip the security balance in favor of the United States, their cooperation remains fairly

[11] Weiss et. al., "The United States, the UN, and New Nationalisms: Old Truths, New Developments." *Global Governance: A Review of Multilateralism and International Organizations* 25, no. 4 (2019): 499-508;

[12] "Paris Climate Agreement." The White House. The United States Government, January 21, 2021. https://www.whitehouse.gov/briefing-room/statements-releases/2021/01/20/paris-climate-agreement/.

[13] "Letter to His Excellency António Guterres." The White House. The United States Government, January 21, 2021. https://www.whitehouse.gov/briefing-room/statements-releases/2021/01/20/letter-his-excellency-antonio-guterres/. /

[14] "U.S. Decision To Reengage with the UN Human Rights Council - United States Department of State." U.S. Department of State. U.S. Department of State, February 10, 2021. https://www.state.gov/u-s-decision-to-reengage-with-the-un-human-rights-council/.

[15] "Remarks by President Biden on America's Place in the World." The White House. The United States Government, February 5, 2021. https://www.whitehouse.gov/briefing-room/speeches-remarks/2021/02/04/remarks-by-president-biden-on-americas-place-in-the-world/.

[16] Yeo, Andrew. "*Asia's Regional Architecture: Alliances And Institutions In The Pacific Century*". Stanford University Press, 2019: 83-116

[17] United Nations General Assembly Twentieth Session: 1332nd Plenary Meeting, (New York, NY, 21 September 1965). United Nations.

[18] Leifer, Michael. "*Singapore's Foreign Policy: Coping With Vulnerability*". Routledge, 2013: 62

[19] Heng, Yee-Kuang. "A Global City In An Age Of Global Risks: Singapore's Evolving Discourse On Vulnerability." *Contemporary Southeast Asia*, 2013: 427

[20] Kausikan, Bilahari. "*This Ain't Kansas, Toto: Some Personal and Eccentric Reflections on the UN*." In 50 Years of Singapore and the United Nations, 2015: pp. 22-34.

[21] Acharya, Amitav. "Singapore's Foreign Policy: The Search for Regional Order". World Scientific, 2008: 33-59

[22] Emmers, Ralf. "The Influence Of The Balance Of Power Factor Within The ASEAN Regional Forum." *Contemporary Southeast Asia* (2001): 275-291.

[23] Chong, Alan. "Singapore's Foreign Policy Beliefs As 'Abridged Realism': Pragmatic And Liberal Prefixes In The Foreign Policy Thought Of Rajaratnam, Lee, Koh, And Mahbubani." *International Relations of the Asia-Pacific* 6, no. 2 (2006): 269-306.

[24] Grzywacz, Anna. "Singapore's Foreign Policy toward Regional and Inter-regional Institutions." *Asian Perspective* 43, no. 4 (2019): 647-671.

[25] Panda, Ankit. "Singapore: A Small Asian Heavyweight." Council on Foreign Relations (2018): 26; Walt, Stephen M. "Alliances In A Unipolar World." *World Pol.* 61 (2009): 86.

[26] Mukherjee, Jaideep. "UNDP And The Making Of Singapore's Public Service: Lessons From Albert Winsemius", United Nations Development Programme Global Centre for Public Service Excellence (2015): 36

[27] Mearsheimer, John J. "Bound To Fail: The Rise And Fall Of The Liberal International Order." *International Security* 43, no. 4 (2019): 7-50.

crucial for regional security. Based on findings of a report by the Institute of Southeast Asian Studies, favorable perceptions towards the United States have grown marginally following a change in the U.S. administration in 2020. Respondents from the region's elites indicated high expectations for the Biden Administration to elevate U.S. engagements in the region. A little less than half also expressed confidence in the new administration to ensure regional security.[28] In this regard, there is potential for Singapore to serve as a strategic intermediary to advance normative understanding within the United States of attitudes and expectations in the region. Notably, a separate study by the Australia-based Lowy Institute (2020) suggested that Singapore has a reasonably high degree of soft power within the Asia-Pacific.[29] Above all, significant initiatives in the past for regional integration involving the United States were known to have 'at least some Singaporean fingerprint,'[30] such as its advocacy for the establishment of the ARF.

Meanwhile, international institutions that have been relatively effective for the promotion of America's objectives are arguably constrained in other instances. Increasingly, there have been calls for a more inclusive representation of the Global South. A proliferation of alternative institutions and contestation of political interests have led to evident institutional fragmentation and stopgap solutions.[31]

Direct or indirect cooperation with Singapore could help to mitigate perceptions of power asymmetry. Conceptually, small states can connect small, middle, and larger states in the international system and facilitate better communication for each side. For this to happen, a small state must have influence in the international arena. Influence, in this case, is qualified firstly, as the ability to obtain formal positions within these institutions, to shape processes and norms, and secondly, in having some degree of peer recognition.[32] Singapore has established a certain level of influence through activist diplomacy – to aggregate interest and set the agenda with the Forum of Small States and Global Governance groupings that it initiated.[33] Singapore has also achieved peer recognition as a neutral arbiter. For instance, it has hosted several meetings between China and Taiwan and between the United States and North Korea.[34]

Institutionalized cooperation will increasingly have to be specialized and targeted, to deal with the expansive scope of challenges, such as environmental issues, public health threats, and transnational crime. By virtue of their expertise in science and technology and building on existing arrangements for cooperation, a partnership between the United States and Singapore on the development agenda can be reasonable.

Institutionalizing peace in the region

Between the strategic goals of a pivot to Asia in 2011 and those of a free and open Indo-Pacific of late, U.S. engagement with countries in Southeast Asia has appeared to be opportunistic. The current narrative of a dominant paradigm of competition with a rising China further advances the notion that bilateral relations with the United States will always be subordinate to great power competition in the region.[35] There is consensus amongst regional observers that the Biden administration has to engage Southeast Asian nations on their merits instead of opting for a selective strengthening of relations for separate ends, such as winning the abstract 'competition with China.'[36]

Southeast Asia's economic, cultural, political, and historical diversity means that countries in the region do not share similar security perceptions and concerns. Singapore is attuned to the domestic sensitivities of its neighbors and can provide contextual intelligence or "an accurate assessment of the circumstances" to be a barometer for regional inclinations.[37] Its support towards an open and inclusive regional security order and institutional cooperation within ASEAN Plus groupings, like the East Asia Summit, ARF, and the ASEAN Defence Ministers Meeting (ADMM) Plus, will also be critical.[38] These serve as vital platforms for what former director of the United States Information Agency, Edward Murrow, would term as the "last three feet" of cross-cultural communication and at the same time enable the United States to "promote American staying power in the region."[39]

Cooperation in operations and crisis management also seems to have taken the form of a networked approach. One of the key concerns from rising maritime tensions and overlapping territorial claims is that littoral Southeast Asian claimants have seen frequent clashes with each other at sea, just as they have with Chinese vessels. ASEAN nations favor a multilateral approach and, moving forward, will likely remain so. Under the ADMM-Plus, Thailand had co-led a joint maritime exercise between ASEAN and the United States Navy, while Singapore co-hosted the inaugural ASEAN–China maritime exercise. While it is premature to ascertain tangible outcomes from these functional interactions, these joint exercises are necessary for capacity-building, to socialize expected behavior of navies and coast guards at sea, and to reduce the risk of accidental conflicts and miscalculations.

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[28] Seah et. al., "The State Of Southeast Asia: 2021." ISEAS-Yusof Ishak Institute (2021).

[29] Lemahieu, Herve, and Alyssa Leng. "Lowy Institute Asia Power Index: Key Findings 2020." (2020).

[30] Kuok, Lynn. "The US-Singapore Partnership: A Critical Element of US Engagement and Stability in the Asia-Pacific." Washington DC: Brookings: *Asian Alliances Working Paper Series* (2016).

[31] Woods, et. al.. "Transforming global governance for the 21st century." *UNDP-HDRO Occasional Papers* 2013/09 (2013); Acharya et.al., "Reshaping Global Order in the 21st Century: G-Plus Leadership in a Multiplex World." *China & World Economy* 27, no. 5 (2019): 63-78; Kruck, Andreas, and Bernhard Zangl. "The Adjustment of International Institutions to Global Power Shifts: A Framework for Analysis." *Global Policy* 11 (2020): 5-16

[32] Panke, Diana. "Dwarfs In International Negotiations: How Small States Make Their Voices Heard." *Cambridge Review of International Affairs* 25, no. 3 (2012): 313-328.; Heng, Yee-Kuang, and Syed Mohammed Ad'ha Aljunied. "Can Small States Be More Than Price Takers In Global Governance?." *Global Governance: A Review of Multilateralism and International Organizations* 21, no. 3 (2015): 435-454; Guo, Yvonne, and Jun Jie Woo, eds. "*Singapore and Switzerland: Secrets To Small State Success*". World Scientific, 2016: 29-46

[33] Braveboy-Wagner, Jacqueline, ed. "*Diplomatic Strategies of Nations in the Global South: The Search for Leadership*". Springer, 2016: 393-424

[34] "Trump-Kim Summit: Other Landmark Meetings Singapore Hosted, Including the Xi-Ma Summit." *The Straits Times*, June 5, 2018. https://www.straitstimes.com/singapore/trump-kim-summit-other-landmark-meetings-singapore-hosted-including-the-xi-ma-summit.

[35] "Biden's Asia Czar Kurt Campbell Says Era of Engagement with Xi's China Is Over." *The Straits Times*, May 27, 2021. https://www.straitstimes.com/world/united-states/us-says-looking-at-quad-meeting-in-fall-focused-on-infrastructure.

[36] Cook, Malcolm, and Storey, Ian. " The Impending Biden Presidency and Southeast Asia." *ISEAS Perspectives* 143 (2020); Anwar, Dewi Fortuna. "Great Expectations: What Southeast Asia Wants From The Biden Presidency." In *East Asia Forum Quarterly*, vol. 13, no. 1, pp. 36-37. 2021; Kausikan, Bilahari. "The Arena: Southeast Asia in the Age of Great-Power Rivalry." *Foreign Affairs*. 100 (2021): 186.

[37] Nye (2019): 73-103

[38] Chong (2006): 269-306.

[39] Cook and Hoang. (2020)

Mobilizing resources for institutional-building

Institutional structures and the distributive justice of global governance might be fiercely contested, but the urgency for countries to cooperate on transboundary issues faces little dispute. Health, digital technology, and the rule of law are examples of such issue-areas of systemic relevance, going beyond contiguous geographical borders. Furthermore, the United States and Singapore are primed for cooperation, having established technical expertise in various fields. Compared to traditional security debates, these three areas are ubiquitous in their involvement of small, middle, and larger states in the decision-making process.

Since 2005, the World Health Organization (WHO) has declared six public health emergencies of international concern. Notwithstanding the fact that primary health systems in many countries need to be strengthened, the current COVID19 pandemic also reflects a visible gap in cooperation on health threats advisory and surveillance.[40] The Global Health Security Agenda (GHSA), initiated by the United States, serves as a crucial lead for this. For over a decade, dialogues on One Health, an integrated approach in managing zoonotic diseases, have regularly been held between healthcare professionals. There is synergistic potential as the two countries have robust clinical and risk communication training programs, that can be scaled up with the support of their designated WHO Collaborating Centres. A joint initiative, as suggested, would also broadly align to the U.S. global health engagement objectives of supporting all countries to prevent, detect, and respond to outbreaks.[41] For Singapore, it provides an opportunity to share its experience in urban health emergency preparedness.[42]

Besides health systems, information communication systems in both industrialized and developing countries are also facing significant strain. National governments have taken to online tools to maintain public services over the past year, while development agencies sought digital solutions for remote access to social services.[43] With intensified use of digital technologies worldwide, parallel progress in harmonizing regulatory frameworks and improving digital access has to be accelerated.

As two of the most digitally competitive countries, the United States and Singapore should actively shape international cyber rules and norms. Based on the International Telecommunications Union data, there are evident gaps in the global framework for ICT regulation. In addition, over half of national digital strategies are coherent on digital technologies for economic goals and digital markets but essentially overlook social policies or human-centric considerations.[44]

"Evidence suggests that digital solutions have a bearing on anti-corruption efforts, given their potential to promote citizen participation in public affairs and reduce discretionary power through increased information availability."

Partnership between the United States and Singapore in cybersecurity and digital connectivity is most substantially demonstrated through existing technical assistance programs to Southeast Asian countries. [45] Singapore has established the ASEAN-Singapore Cybersecurity Centre of Excellence.[46] Moving ahead, more extensive plurilateral cooperation can be explored at a city or municipality level, taking into account how different administrative areas might share similar development experiences. Entities such as the global hub on cyber-crime of INTERPOL and the UNDP Global Centre for Technology, Innovation, and Sustainable Development, both based in Singapore, can also be brought on as knowledge partners.

Lastly, a comprehensive discussion of the global development agenda has to include transparent and accountable governance. Partnership between the United States and Singapore is purpose-built in this regard. Findings from the annual Transparency International report reflect a shared commitment towards the rule of law and stewardship in anti-corruption.[47] They also actively shape debates and are well-represented at key platforms, such as the G20 Anti-Corruption Working Group and International Anti-Corruption Coordination Centre. Under the Third Party Training Programme, the two countries have also periodically collaborated on workshops and field studies centered on judicial governance and intellectual property rights for Southeast Asian countries.

Evidence suggests that digital solutions have a bearing on anti-corruption efforts, given their potential to

[40] Lal, et. al.. "Fragmented Health Systems In COVID-19: Rectifying The Misalignment Between Global Health Security And Universal Health Coverage." *The Lancet* (2020); Machalaba et. al., "Gaps In Health Security Related To Wildlife And Environment Affecting Pandemic Prevention And Preparedness, 2007–2020." *Bulletin of the World Health Organization* 99, no. 5 (2021): 342.

[41] "Fact Sheet: President Biden to Take Action on Global Health through Support of COVAX and Calling for Health Security Financing." The White House. The United States Government, February 18, 2021. https://www.whitehouse.gov/briefing-room/statements-releases/2021/02/18/fact-sheet-president-biden-to-take-action-on-global-health-through-support-of-covax-and-calling-for-health-security-financing/.

[42] "Close Global and Multilateral Cooperation Key to Fighting Pandemics: PM Lee at G-20 Health Summit." *The Straits Times*, May 22, 2021. https://www.straitstimes.com/singapore/close-international-and-multilateral-cooperation-is-key-to-fight-pandemics-pm-lee-hsien.

[43] Compendium of Digital Government Initiatives in response to the COVID-19 Pandemic. United Nations Department of Economic and Social Affairs, October 6, 2020. https://publicadministration.un.org/egovkb/Portals/egovkb/Documents/un/2020-Survey/UNDESA%20Compendium%20of%20Digital%20Government%20Initiatives%20in%20Response%20to%20the%20COVID-19%20Pandemic.pdf.

[44] "Global ICT Regulatory Outlook 2020 - Pointing the Way Forward to Collaborative Regulation." ITU, April 16, 2020. https://www.itu.int/pub/D-PREF-BB.REG_OUT01-2020.

[45] "Singapore and the United States Sign Declaration of Intent on Cybersecurity Technical Assistance Programme." Cyber Security Agency, November 16, 2018. https://www.csa.gov.sg/news/press-releases/singapore-and-the-us-sign-doi-on-cybersecurity-technical-assistance-programme; "Opening Speech by Mr S Iswaran, Minister for Communications and Information, Minister-in-Charge of Cybersecurity, at the ASEAN Ministerial Conference on Cybersecurity 2019." Cyber Security Agency, October 2, 2019. https://www.csa.gov.sg/news/speeches/asean-ministerial-conference-on-cybersecurity-2019.

[46] "Intervention by Dr Yaacob Ibrahim, Minister For Communications and Information And Minister-In-Charge Of Cyber Security at the 15th ASEAN TELMIN." Cyber Security Agency, November 27, 2015. https://www.csa.gov.sg/news/speeches/intervention-by-minister-yaacob-ibrahim-at-the-15th-asean-telmin.

[47] "Corruptions Perception Index", Transparency International, January 28, 2021. https://images.transparencycdn.org/images/CPI2020_Report_EN_0802-WEB-1.pdf.

promote citizen participation in public affairs and reduce discretionary power through increased information availability.[48] The United States and Singapore can expand cooperation to facilitate knowledge transfer on these digital tools and equip practitioners with up-to-date data on governance and anti-corruption mechanisms. These are expected to ensure effective delivery of public services and build regional resilience as countries take steps towards socioeconomic recovery from the pandemic.

Conclusion

The United States and Singapore share longstanding support for strengthening regional and global institutions. Central to this is a fundamental belief in the value of institutions and their obligations towards collective action. Amidst uncertain geopolitical tensions, regional cooperation under the ASEAN Plus groupings serves as a crucial channel for preventive diplomacy and confidence-building. In terms of the global development agenda, the two countries maintain a certain degree of convening power with their considerable leadership and technical expertise in various fields. The United States and Singapore should build on existing arrangements to advance partnerships in global public health, collaboration ICT regulations and cyber norms, the promotion of the rule of law, and combating corruption.

[48] Park, Chul Hyun, and Koomin Kim. "E-Government As An Anti-Corruption Tool: Panel Data Analysis Across Countries." *International Review of Administrative Sciences* 86, no. 4 (2020): 691-707; Mouna et. al., "International Comparative Evidence Of E-Government Success And Economic Growth: Technology Adoption As An Anti-Corruption Tool." *Transforming Government: People, Process and Policy* (2020).

5

The FTA with the United States and market reforms in Singapore

James Guild

Abstract

Since the U.S.-Singapore Free Trade Agreement went into effect in 2004, Singapore has grown as a key bilateral trading partner of the United States. The United States runs a trade surplus with Singapore, led by high value-added service exports such as R&D. The FTA has made an even more significant impact in accelerating cross-border capital flows. This level of exchange is possible because the FTA guarantees reciprocal market access governed by a set of consistent, mutually agreed upon rules. The most obvious benefit to U.S. investors and companies is that the FTA has expanded their options for engaging the Singaporean market and the ASEAN region. They can take direct equity stakes in Singaporean companies, set up enterprises to compete in Singapore, or domicile a subsidiary or holding company in Singapore in order to invest in other parts of ASEAN. Investors feel safe using Singapore to engage the region because of the country's sound regulatory architecture, favorable tax laws and credible commitments to abide by the pro-market terms of the US-SG FTA. In turn, the FTA has helped transform Singapore into a major financial hub in one of the fastest growing regions in the world. A key component of this success is how Singapore's government-linked companies (GLCs) and its sovereign wealth fund, Temasek Holdings, have adapted to the demands of market liberalization without completely ceding control of strategic sectors. In other sectors, such as manufacturing, which was once the cornerstone of industrialization, Temasek has largely divested its holdings and cleared the way for U.S. companies to expand aggressively in the local market. Understanding Temasek's holding strategy and the state's obligations under the FTA is important because it shapes the opportunity structure for U.S. investment in Singapore. It can also provide a useful roadmap for informing the U.S. Trade Representative's strategy in negotiating FTAs with other countries in the region with large state-owned sectors.

Introduction

When the U.S.-Singapore Free Trade Agreement came into effect on January 1, 2004, it contained an unusual provision: Article 12.3 called for Singapore to reduce 'with a goal of substantially eliminating, its aggregate ownership' in government enterprises.[1] That U.S. trade negotiators felt it necessary to include this provision indicates the extent to which they worried that Singaporean companies with ties to the state would have unfair, anti-competitive advantages. The role of Singapore's government-linked companies (GLCs) was thus a controversial issue. GLCs like DBS, NatSteel, Neptune Orient, and Sembawang Corporation had been instrumental in the country's export-led industrialization. Still, the government was now reckoning with how to balance these one-time national champions of industry against the free market demands of globalization.

In the late 1980s and early 90s, Singapore's sovereign wealth fund, Temasek Holdings, began divesting ownership in a number of GLCs, a process that sped up after the FTA came into effect. Temasek exited sectors such as steel, shipping, and semiconductors while retaining a presence in areas considered of national strategic importance or which had the potential for strong global growth such as infrastructure, banking, telecom, airlines, shipyards and real estate. In companies where Temasek retained substantial shareholdings, efforts were made to focus on a few key business areas. Singapore also undertook reforms to further liberalize its financial markets and introduced the 2004 Competition Act, creating a legal and regulatory framework designed to ensure competitive market conditions and guarantee investment security. Since then, the country has seen a sharp acceleration in capital inflows, with the United States leading the way with $288 billion of FDI in 2019.[2]

This creates an interesting puzzle because Temasek remains actively involved in many of Singapore's largest companies, and maintains full monopolies in critical sectors such as television broadcasting and the port authority. One might think that the continued participation of the state as an active participant in the market would preclude Singapore from becoming an important bilateral trading partner of the United States and a booming hub for cross-border capital flows, as such a holding structure might be considered anti-competitive in a traditional free market framework. But U.S.-Singapore bilateral trade has flourished, suggesting that Temasek has managed its presence in the Singaporean economy in such a way as to thread the needle of the Washington Consensus. It has retained a significant presence in key sectors while removing itself from others and creating space for private companies, including U.S. companies, to enter the Singaporean market in various ways.

This paper argues that a state need not withdraw itself completely as an active participant in the market to become an important trading partner of a country like the United States, which advocates for free and lightly regulated markets, and that competitive market conditions can co-exist with state ownership. The Singapore case shows that states can divest selectively from GLCs and make room for private capital, without compromising their strategic interests. This can be seen in how Singapore's financial services sector has become deeply integrated with the U.S. and global capital markets, but also in areas like manufacturing, where after Temasek divested its holdings, U.S. companies moved in to expand their footprints. Understanding this holding strategy and the relationship between state and market in Singapore can help improve regulatory oversight, identify profitable investment opportunities, and inform negotiating strategies between the United States and other bilateral trading partners with large state-owned sectors.

The Temasek Charter

The late 1990s and early 2000s saw the Washington Consensus – a general belief that deregulation and free markets were the best engines of growth – reach the height of its policy relevance. There was a lot of pressure for countries to pursue economic policies that championed the primacy of free and lightly regulated markets. This drew into question whether and how Singapore's development model, which heavily featured government-linked companies like Singtel, Singapore Airlines, NatSteel, DBS, Neptune Orient, and Sembawang Corporation, could adapt to meet the demands of the Washington Consensus.

"One might think that the continued participation of the state as an active participant in the market would preclude Singapore from becoming an important bilateral trading partner of the United States and a booming hub for cross-border capital flows, as such a holding structure might be considered anti-competitive in a traditional free market framework. But U.S.-Singapore bilateral trade has flourished…"

One of the key players in Singapore's developmental story has been Temasek Holdings. Temasek was formed in 1974 to manage national strategic assets, creating a layer of insulation between the government and direct ownership of its commercial and industrial assets. As Singapore entered the 21st century and the pressure to liberalize increased, the natural question was what role Temasek and the GLCs it wholly or partially owned would play. Prior to the 2004 execution of the FTA, Parliament was already anticipating the necessity of major structural changes to its political economy, especially the future role of its GLCs. There was recognition that, with "globalization… and deregulation driving towards a knowledge-based economy, the developmental state… [had] to reinvent itself."[3]

In 2002, Parliament debated and passed a motion concerning the Temasek Charter. It was agreed that the

[1] "US-Singapore Free Trade Agreement," Office of the US Trade Representative, accessed April 1 2021, https://ustr.gov/trade-agreements/free-trade-agreements/singapore-fta/final-text

[2] "Singapore," Office of the US Trade Representative, accessed April 1, 2021, https://ustr.gov/countries-regions/southeast-asia-pacific/singapore

[3] Linda Low, "Rethinking Singapore Inc. and GLCs," *Southeast Asian Affairs* (2002): 282-302.

"government will divest [GLCs] that do not have the potential for international growth or serve no strategic purpose."[4] They agreed this would be done only at the right price and at a pace that suited the government since they did not need to sell these assets to raise funds but rather to position the economy for sustainable long-term growth. They also pushed back against external pressure from proponents of the Washington Consensus, such as the World Bank and the IMF, for the state to totally exit the market: "As the economy grows, and the private sector expands, the shape of government in business will change. The key is not whether companies are government-owned, but whether they are well run, entrepreneurial and profitable."[5]

Singapore was proposing to split the difference with the Washington Consensus, pursuing market reforms and divesting from state ownership in certain sectors, while retaining a presence in others with global growth potential or strategic value. Gradual market-oriented reforms and liberalization of key sectors had been underway since the late 1980s but the Temasek Charter, like the FTA, formally codified and spelled out the principles under which these efforts would be pursued. If this needle could be successfully threaded, the pay-off would be greater access to U.S. capital markets and potentially massive financial inflows.

From the 1990s, in anticipation of more global integration and competition, Singapore began rolling out reforms aimed at improving corporate governance.[6] These reforms were capped off by the passage of the 2004 Competition Act. Coinciding with the commencement of the FTA, it created a legal and regulatory framework designed to ensure competitive market conditions and guarantee investment security.

Examples of these reforms include Singtel's monopoly in the telecommunication sector being ended and its aggressive strategy of acquiring overseas assets, including 100% ownership of Australia's Optus, and stakes in major telecommunication companies in Thailand, Indonesia and the Philippines. Over-extended conglomerates Sembawang Corporation and Singapore Technologies Industrial Corporation were merged in 1998 and their periphery businesses sold, leading to a renewed focus on just a few strategic areas like marine engineering.[7] DBS' real estate investment arm was spun off into CapitaLand in 2000, signaling that while Temasek would remain the major shareholder, DBS would be focused on banking and financial services, and its interests would not stretch across the entire economy.[8]

Other companies, such as MediaCorp and the Port of Singapore Authority, are still 100% owned by Temasek and are likely to remain so. This is because they are considered part of the country's strategic infrastructure, and the government does not want to open them to market forces and private competition. It experimented with the privatization of infrastructure with SMRT, the state-owned transport company responsible for operating Singapore's first mass transit line in the 1980s. In 2000 it was publicly listed on the Singapore Stock Exchange, but it struggled to keep costs reasonable while meeting operational demands. In 2016, Temasek bought back all shares in a S$1.18 billion deal.[9] This shows that there are limits to Singapore's willingness to privatize key public infrastructure.

But perhaps most importantly, Temasek has shown that it is committed to divesting from GLCs that do not meet the "well run, entrepreneurial and profitable" standard. NatSteel, an important legacy company from Singapore's early industrialization, was sold in 2002.[10] Temasek sold its 67% ownership stake of the Neptune Orient shipping line in 2015 for a competitive price.[11] Singapore Petroleum, an oil and gas company that had been around since the 1960s and was controlled by Keppel Corp, was sold off to Chinese oil and gas company PetroChina in 2009.[12] Temasek also sold its nearly 60% stake in Chartered Semiconductor Manufacturing in 2009.[13] Temasek's exit from this sector, in particular, has opened up enormous opportunities for U.S. companies, as the next section will discuss.

This is a critical aspect of Temasek's obligations under the terms of the FTA and its adherence to the Temasek Charter principles. It demonstrates that the state will not prop up unprofitable companies that serve no economic or strategic purpose. This means that although the state remains an active participant in the economy and will resist privatizing key sectors, it has shown a credible commitment to divesting from others and allowing private businesses to enter and freely compete. This is how Singapore has split the difference with the Washington Consensus and the FTA, reducing its aggregate ownership in non-strategic or unprofitable sectors, while widening the public float or completely divesting in others. The following section will describe some of the direct benefits these structural reforms have returned to U.S. interests.

Opportunities created by the U.S.-Singapore FTA for American companies

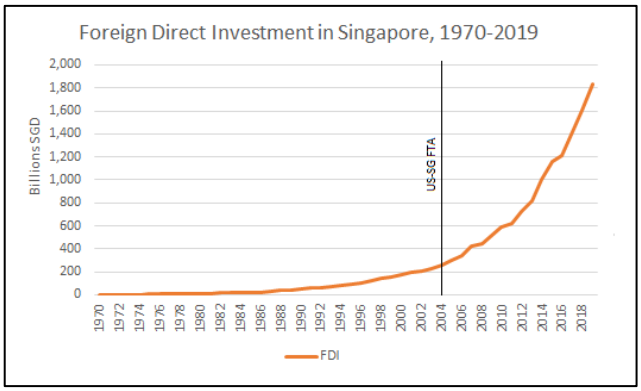


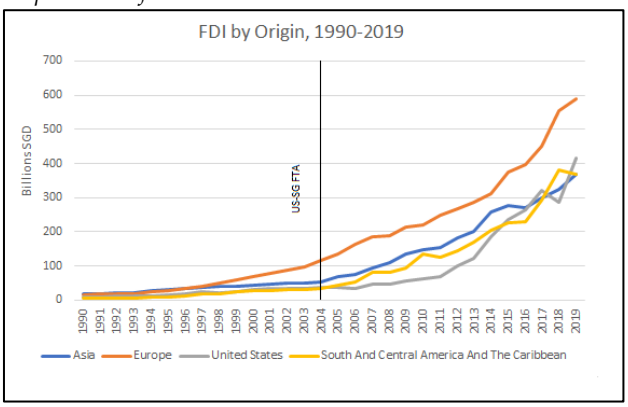
Figure 1. Foreign direct investment in Singapore, 1970 to 2019. In billions SGD. Source: Singapore Department of Statistics

[4] "Motion on Temasek Charter and EISC'S Recommendations on Government in Business," *Notice Paper No. 140 of 2002*, accessed April1, 2021, https://www.nas.gov.sg/archivesonline/data/pdfdoc/2002082802.htm
[5] Ibid.
[6] Zhang, Xiaoke. *The Political Economy of Capital Market Reforms in Southeast Asia*, Palgrave: New York, 2011, p 100.
[7] "1998 Annual Report," SembCorp, accessed April 1, 2021, https://www.sembcorp.com/en/investor-relations/results-and-reports/reports/
[8] "Pidemco Land to merge with DBS Land to create CapitaLand,"CapitaLand website, accessed April 1, 2021, https://investor.capitaland.com/news.html/id/588573
[9] Min, Chia Yan and Marissa Lee, "Temasek makes $1.18b buyout offer for SMRT," *Straits Times*, July 21, 2016.
[10] "Temasek to sell its stake in NatSteel," Press Release, Temasek Holdings, accessed April 1, 2021, https://www.temasek.com.sg/en/news-and-views/news-room/news/2002/temasek-to-sell-its-stake-in-natsteel
[11] Bangkok Post. "CMA CGM to buy Neptune Orient Lines for B87bn," December 7, 2015.
[12] RTTNews. "PetroChina acquires 45.5% Stake in Singapore Petroleum," May 25, 2009.
[13] Pinaroc, Joel D. "Singapore chip foundary sold to Abu Dhabi," *ZDNet*, September 7, 2009.

Figure 1 shows the remarkable growth in foreign direct equity investment into Singapore over the last fifty years. This figure does not include inter-company loans (such as when a foreign company transfers money to one of its Singaporean subsidiaries). Equity investment is when a non-resident investor acquires 10% or more of the controlling shares in a company. The figure shows that inward FDI had been rising before the signing of the U.S.-Singapore FTA, but it really accelerated afterward, reaching more than S$1.8 trillion of inflows in 2019.

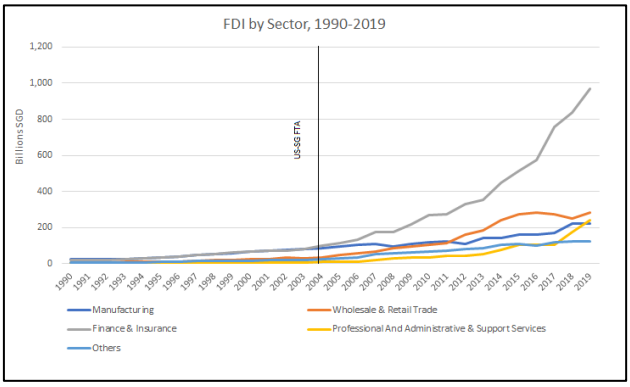
Breaking it down further by country of origin (Figure 2) shows that FDI is coming from all over the world into Singapore, but the United States is consistently the largest source of capital by country.

Figure 2. Foreign direct investment in Singapore by region of origin, 1990 to 2019. In billions SGD. Source: Singapore Department of Statistics.



Perhaps most interesting to note are the sectors these investment flows are going into. As Figure 3 shows, the financial sector has grown to become far and away the largest recipient of FDI in Singapore, and that is a trend that clearly accelerated after the commencement of the FTA. Manufacturing, the traditional engine of economic growth in Singapore's developmental state phase, currently accounts for a much smaller share than finance.

Figure 3. Foreign direct investment in Singapore by sector, 1990 to 2019. In billions SGD. Source: Singapore Department of Statistics



The majority of this investment goes into non-bank holding companies, and is often re-invested into other countries around the region. Domiciling a holding company in Singapore can be an attractive option because of its reliable regulatory architecture and favorable tax laws. When the Singaporean government decided to restructure its state-owned sector and pursue liberal market reforms, it did so to rebalance its economy away from manufacturing and exports and toward a more mature economy centered around high-skill, high-wage, high value-add services like finance. As the figures above show, this strategy has been quite successful and has given U.S. investors an important entry point for engaging the region.

In addition to accelerating capital flows, the liberalization of the financial sector has returned other benefits to U.S. interests. In 2004, almost as soon as the FTA went into effect, U.S. financial institution Citibank was granted permission to set up a wholly-owned subsidiary in Singapore, giving it an early edge over other foreign competitors in expanding its banking and wealth management business in the region.[14] Citibank remains one of the largest foreign banks in Singapore, where it actively competes with local banks on equal terms, including DBS, where Temasek is the largest shareholder.

Temasek has also gradually reduced its ownership in many GLCs, widening the public float so that private investors can take larger equity shares in Singaporean blue chips. For instance, by 2017, Temasek held around 52% of the shares in Singtel, a considerable reduction from the 65% it held in 2004. This follows its obligation under the rules of the FTA to reduce aggregate ownership in the economy and create space for U.S. interests to enter the market as equity investors. Because many Singaporean companies use a nominee shareholder structure, it is difficult to say exactly which U.S. companies own which equity stakes, but Citibank is often the largest shareholder nominee. U.S. private equity giant BlackRock is the second largest shareholder behind Temasek in Keppel Corporation, a major Singaporean conglomerate.[15] This indicates that the liberalization of Singapore's financial system has been sufficient to induce large inflows of U.S. investment, creating opportunities for both U.S. equity investors and banks like Citi to expand their footprint and compete in the local market. Even as the state retains substantial ownership interests in the industry, it has not crowded our private investment and has, in fact, expanded opportunities for private capital in many instances.

Another area that has benefited U.S. interests as a result of Temasek's divestments is in manufacturing. Singapore tends to focus on high value-added manufacturing, producing goods that require high human capital and technology levels, such as semiconductors, specialty equipment, and chemicals. After the FTA, U.S. companies like National Oilwell Varco and Baker Hughes began expanding their presence through acquisitions, buying companies that made subsea blowout valves, or provided consulting services for drilling. Chemical manufacturer 3M opened a production facility in 2009, and Coca Cola opened a $72 million concentrate plant in 2011.

But it has been in semiconductor manufacturing where Temasek's exit from the market opened up room for U.S. companies. In 2009, Temasek divested from Chartered Semiconductor Manufacturing, which U.S.-based company GlobalFoundries later acquired. Singaporean semiconductor manufacturing has seen a sharp rebound in

[14] *ATM Marketplace*. "Citibank hopes incorporation will give it access to Singapore ATMs," June 28, 2004. Accessed April 1, 2021 https://www.atmmarketplace.com/news/citibank-hopes-incorporation-will-give-it-access-to-singapore-atms/

[15] 2019 Annual Report, Keppel Corporation.

recent years, possibly as companies diversify their supply chains away from Taiwan and China. The result is that U.S. companies like Micron Technology, GlobalFoundries and Flex have been pouring billions of dollars into expanding their facilities in Singapore, and production has increased dramatically.[16] With Temasek ceding its market share to GlobalFoundries, and the government offering attractive investment incentives, semiconductor manufacturing has become a major area of growth and investment for U.S. companies in Singapore.

Takeaways from Singapore and other FTAs in Southeast Asia

Singapore's economic trajectory shows that it is possible to pivot from manufacturing-led state developmentalism to a high-value-added and more mature form of state capitalism that can be integrated into global networks of capital flows, financial services, trade, and investment even if the state does not completely exit the market. This was accomplished through credible commitments to market reforms, including ending certain monopolies, divesting from unprofitable GLCs, and trimming others down to focus on specific business areas such as marine engineering. At the same time, Temasek has reserved the right to retain complete or partial ownership in key industries that are either highly profitable and globally competitive, such as telecommunications, or where profit-maximization may interfere with the ability to deliver an affordable public good like public transit.

Singapore has not completely embraced a free market turn. Instead, it has partially pivoted into a mixed state capitalist system that leverages the efficiency of markets for some purposes, while retaining control over areas of strategic political or economic value. Based on the volume of capital flows entering Singapore in recent years, it would appear global investors led by the United States have found this partial turn toward the market to be satisfactory. It has created opportunities for U.S. investors and companies to found wholly owned subsidiaries, take equity stakes in Singaporean blue chips and enter competitive sectors and compete against local and foreign companies on equal footing. One important question is whether the lessons gleaned from Singapore's evolution under the Temasek Charter strategy and the U.S.-Singapore FTA can be applied outside Singapore.

This is an important question for the region, and for developmental states in general, as almost every country in ASEAN has large state-owned sectors that are arguably crowding out more efficient private capital. Many of Singapore's neighbors, such as Vietnam, are currently trying to pull off the same trick, equitizing portions of their state-owned sectors in order to make the country a more attractive destination for private investment. That Vietnam has struggled to privatize many of these assets, such as its state-owned electricity generation companies, underlines how difficult it is to ape the Singapore model.[17]

There are some general lessons to be gleaned, however. The first is that, the political class needs sufficient motivation to take on the difficult task of getting the state out of the economy. Once the state is entangled in an economy, it is very difficult to get it out since there is now a powerful network of vested interests embedded in maintaining this state-corporate nexus. In Singapore's case, the political cohesion of the PAP and their shared policy vision meant the political will was there to pursue such market reforms. The ultimate goal was to transition to a more globally competitive economy that would be seen as an attractive destination for foreign capital, and this vision was widely shared amongst Singapore's political and corporate elite.

Dangling access to U.S. financial markets can be a very persuasive carrot when it comes to inducing this kind of transition. Still, the process by which domestic political coalitions for pro-market reforms are built will vary from country to country. There is no one-size-fits-all. Once the political will does exist for reforms, however, the other key lesson from the Singaporean experience is that you need not commit 100% to neoliberal orthodoxy and privatize everything.

"The Singapore model suggests that if the state is going to retain ownership of certain companies, it should sell off periphery businesses and focus only on core activities, exit those that are unprofitable, and increase the share of public ownership."

The main insight from Singapore's model of state capitalism, which likely has widespread applicability, is that the state can be selective in its divestment strategy. It need not extricate itself entirely from strategic assets which are meant to provide affordable public goods like transit services, or which are profitable and have global growth potential. The Singapore model suggests that if the state is going to retain ownership of certain companies, it should sell off periphery businesses and focus only on core activities, exit those that are unprofitable, and increase the share of public ownership. This signals markets that while the state may not completely remove itself from the economy, it is willing to make room for private capital.

Policy recommendations

1. The U.S.-Singapore FTA strengthened and expanded financial ties between Singapore and the United States by guaranteeing and regularizing reciprocal access to each countries' financial markets. Key to deepening these financial flows has been a commitment on Singapore's part to reforming its financial sector including risk-based regulatory guidance and allowing foreign banks to compete with GLCs like DBS on equal footing. It is thus important that regulators like the Monetary Authority of Singapore remain responsive and adaptable in updating regulatory frameworks to ensure competitive conditions continue to prevail in the financial services sector and that both foreign and domestic banks have access to the same range of opportunities, including for instance in the issuance of digital banking licenses.

[16] Ryugen, Hideaki. "Micron taps Singapore as launch pad for NAND offensive," *Nikkei Review*, February 3, 2021.

[17] *Vietnam Investment Review*. "Investors give EVN Genco 2 cold shoulder at IPO," February 8, 2021.

2. Temasek's divestment and holding strategy shapes the opportunity structure for U.S. investors seeking to engage the Singaporean market outside of financial services. As the semiconductor industry showed, when Temasek exits an industry, it can create substantial opportunities for U.S. companies to come in and fill the void. Other competitive sectors where Temasek has divested, and there is considerable scope for U.S. companies to expand, would be consumer and retail goods and energy. These sectors represent prime areas that would benefit from aggressive promotion to U.S. investors via the Singapore Economic Development Board.

3. This paper also has broader policy implications for FTAs being negotiated between the United States and emerging markets in the region with large state-owned sectors such as Malaysia, Thailand, Vietnam, and Indonesia. The role of state-owned companies will be a significant sticking point for countries seeking equal access to U.S. markets. The Singaporean case provides a useful roadmap for policymakers and negotiators from both parties. The main takeaway is that, to secure an FTA with the United States, a state need not divest itself entirely from the ownership structure of the economy and can retain monopoly or majority control over critical sectors like public infrastructure. But it must do so according to a set of clear and consistently applied principles such as those laid out in the Temasek Charter and must ensure that sectors that are not of strategic importance are opened up to competitive market forces and subject to competent regulatory oversight. If this lesson is internalized by policymakers in emerging markets, they can pursue divestment strategies that will open up opportunities for free trade with the United States. Likewise, this can inform U.S. Trade Representative strategy as they approach such negotiations. It is not an all-or-nothing proposition when it comes to the state's role in a mixed capitalist economy; the key is to secure divestment in specific sectors.

"It is not an all-or-nothing proposition when it comes to the state's role in a mixed capitalist economy; the key is to secure divestment in specific sectors."

6

Analyzing U.S.–Singapore maritime security cooperation through the Indo-Pacific lens

Ankush Wagle

Abstract

Singapore is arguably the United States' closest partner in Southeast Asia. Ties between the two sides are comprehensive and extend across politics, economics, and security. Given Singapore's strategic coastal location, maritime defense is an especially critical component of the relationship. The longstanding and steadfast U.S.–Singapore maritime defense cooperation could receive a fillip through the 'Indo-Pacific' concept, which has become a geopolitical cause célèbre of late. Several countries within the Indo-Pacific geography (including large powers, such as the United States, India, Japan, and Australia) have laid out defense strategies and initiated mechanisms about the zone. As the polity spanning both the Indian and Pacific Oceans, ASEAN is also at the core of Indo-Pacific dynamics. Therefore, the implications of the Indo-Pacific are salient for contemporary U.S.–Singapore maritime defense and warrant analysis. To that end, this paper aims to both contextualize and analyze U.S.–Singapore maritime defense ties through an Indo-Pacific lens.

Introduction

The United States and Singapore commemorated half a century of formal diplomatic ties in 2016. The United States recognized Singapore as a sovereign nation a mere two days after it declared independence in 1965, and the existing American consulate general in Singapore was upgraded to an embassy on April 4, 1966.[1] Today, despite their apparent differences in size and strength, the two sides share a close and multi-faceted relationship that extends across politics, economics, and security. Defense ties have especially been an essential aspect of overall relations since 1966. With Singapore and the United States both being coastal states, maritime security is an area of particularly close cooperation and alignment. That security is now increasingly viewed through the 'Indo-Pacific' lens, a salient concept of late in geopolitical analysis.

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This paper analyzes contemporary U.S.–Singapore maritime security relations in the context of the Indo-Pacific and posits that beyond the robust existing ties, the Indo-Pacific presents some opportunities for intensifying cooperation, albeit with potential divergences in thinking between the two sides. The first section provides a brief overview of maritime security relations from inception to the present, covering agreements, exercises, and modes of cooperation. The following section introduces the Indo-Pacific concept as a new paradigm for maritime security, along with American and Singapore perspectives. The following two sections analyze prospects for cooperation and potential divergences, respectively, followed by a conclusion.

Singapore–U.S. maritime security: from past to present

Singapore's military relations with the United States began with the withdrawal of the British Empire from Southeast Asia in the late 1960s. From 1967 to 1971, Britain withdrew its troops and vacated its bases in Singapore as part of its 'East of Suez' policy. Singapore then was ill-equipped to provide for its own defense and preferred a longer, phased withdrawal. Recognizing the need for a stabilizing force in the region, especially with the spread of communism, Singapore's founding Prime Minister, Lee Kuan Yew (who had previously espoused anti-American sentiment), came to view the United States as the 'only countervailing power to communism' and sought to engage it in Singapore's security apparatus.[2] During his 1967 visit to Washington D.C., Lee offered regular use of Singapore's docks as maintenance and repair facilities for American naval vessels.[3] In turn, the American defense establishment recognized the strategic importance of Singapore in the aftermath of Britain's withdrawal. Following Lee's visit, the Americans favorably assessed Singapore's dockyards as repair stations and, by 1968, they became integral to America's Vietnamese operations. These early relations continued after the Vietnam War.[4]

A pivotal moment in bilateral maritime security cooperation came in 1990, with the Memorandum of Understanding (MoU) Regarding the United States Use of Facilities in Singapore. Signed by Lee Kuan Yew and American Vice-President Dan Quayle, the agreement facilitated access for transiting American forces to Singapore's military facilities. An addendum, signed in 1998, further allowed American use of Changi Naval Base, which had commenced operations that same year. The United States has since used these bases for the rotational deployment of its Littoral Combat Ships and naval aircraft. The MoU was renewed first in 2005 and then again in 2019, extending its validity for another 15 years.

Since its signing, the MoU has been an enduring keystone of U.S.–Singapore security cooperation over the last three decades. Immediately after it was signed in 1990, it gained additional strategic importance over the next two years as the United States closed its long-held Clark and Subic Bay military bases in the Philippines in 1991 and 1992, respectively. The U.S. Navy shifted its Commander, Logistics Group Western Pacific task force (CTF 73/COMLOG WESTPAC) to Sembawang base from Subic Bay in 1992. CTF 73 acts as a 'logistics agent' for the U.S. Navy's 7th Fleet and a Threat Security Cooperation (TSC) agent for the Southeast Asian region.[5]

Along with the MoU, two other broader agreements underpin bilateral maritime security: the Strategic Framework Agreement for Closer Cooperation and Partnership in Defence and Security (SFA), signed in 2005, and the enhanced Defence Cooperation Agreement (DCA), signed in 2015. The SFA designated Singapore as a 'Major Security Cooperation Partner' while the DCA introduced high-level dialogues to improve security collaboration.

In practical terms, the two sides collaborate comprehensively to promote maritime security. Since 1995, the two navies have conducted the bilateral Cooperation Afloat Readiness and Training (CARAT) Exercise annually. Previous iterations of these exercises have involved hundreds of naval service personnel and vessels, including ships, submarines, and aircraft participating in various drills.[6] In 2017, the two sides launched Exercise Pacific Griffin, a bilateral initiative that involves exercises of 'substantial scope and complexity' for better mutual understanding and interoperability between naval forces.[7] Multilaterally, the two sides have participated in exercises involving other partners in the region. The inaugural ASEAN–U.S. Maritime Exercise (AUMX) took place in 2019,

[1] "History of the U.S. and Singapore." U.S. Embassy in Singapore, 2021, https://sg.usembassy.gov/our-relationship/policy-history/io/
[2] Daniel Chua, *US-Singapore Relations, 1965-1975 Strategic Non-Alignment in the Cold War* (Singapore: National University of Singapore Press, 2017), 98.
[3] Ibid.
[4] Ibid.
[5] "Command History." Commander, Logistics Group Western Pacific, U.S. Navy, 2021, https://www.clwp.navy.mil/History/
[6] Yang, Calvin. "Singapore-U.S. Carat exercise kicks off", *The Straits Times*, July 20, 2016, https://www.straitstimes.com/singapore/spore-us-carat-exercise-kicks-off
[7] "Singapore and U.S. Navies Conduct Bilateral Exercise Pacific Griffin", Ministry of Defence Singapore, October 2, 2019, https://www.mindef.gov.sg/web/portal/mindef/news-and-events/latest-releases/article-detail/2019/May/14may19_fs

involving vessels and personnel from six ASEAN countries, including Singapore. Singapore is a regular participant in the U.S.-led Southeast Asia Cooperation and Training (SEACAT) exercise, which began post-9/11 and completed its 18th iteration this year. The United States and Singapore also collaborate in other regional maritime exercises and forums such as the U.S. Navy's Rim of the Pacific Exercise (RIMPAC), the Exercise Malabar with the Indian Navy, and the Western Pacific Naval Symposium (WPNS). The United States is also one of the 'contracting parties' to the multination Regional Agreement on Combatting Piracy and Armed Robbery against Ships in Asia (ReCAAP), under which an Information Sharing Centre (ISC) was established in Singapore in 2006.

Contemporary Asian international relations are evolving within the concept of the Indo-Pacific. Therefore, in addition to reviewing the scope of U.S.-Singapore maritime cooperation, a comparison of U.S. and Singapore perspectives on this relatively recent construct is instructive in understanding where each country stands from a strategic viewpoint.

The Indo-Pacific paradigm: comparing perspectives from the United States and Singapore

The term 'Indo-Pacific' postulates a connection of the maritime expanses of the Indian and Pacific Oceans. This massive space covers most of the earth's geography and has significant implications for economics and security in particular. Although the term has gained salience in recent geopolitical analysis, usage of the 'Indo-Pacific' extends back to the early twentieth century. Notably, in 1925, German statesman and professor Karl Haushofer wrote about the *Indopazifischen Raum* (Indo-Pacific region) in his seminal work *Geopolitics of the Indian Ocean*.[8] In contemporary times, the concept gained prominence when Japanese Prime Minister Shinzo Abe spoke of the 'confluence of the two seas of the Indian and Pacific Oceans' in a 2007 speech to the Indian parliament.[9] Over the last two decades, it has become a mainstay of maritime strategies for large and middle powers such as the United States, Australia, Japan, and India. Southeast Asia being the landmass at the center of the two oceans, ASEAN is an inescapable part of the Indo-Pacific geography. Thereby many of these strategies refer to the idea of 'ASEAN centrality,' underscoring the institution's importance in Indo-Pacific mechanisms.

The Indo-Pacific has become a significant part of the United States' strategic outlook, especially during the Trump administration's tenure when the president used it in official statements, replacing the traditional 'Asia-Pacific.' Over the last four years, the term has become central to the American security lexicon. In 2018, it notably featured in the National Defense Strategy, and the U.S. military renamed its Pacific Command to 'Indo-Pacific Command' (INDOPACOM). The following year, the Department of Defense (DoD) released two reports outlining U.S. strategies and visions for the Indo-Pacific. The first of these, the Indo-Pacific Strategy Report, released on June 1, 2019, clearly highlighted America's vision of a 'free and open Indo-Pacific' (FOIP) and the principles underpinning the same: respect for sovereignty, peaceful dispute resolution, free and fair trade, and adherence to international law.[10] In 2019, in a keynote speech at the Shangri-La Dialogue, then-Acting Secretary of Defense Patrick Shanahan reiterated these principles and vision while identifying the Indo-Pacific as the 'priority theatre' of the DoD.[11] America's Indo-Pacific strategy also involves multilateral cooperative mechanisms with like-minded allies and partners. One core mechanism is the Quadrilateral Security Dialogue or 'Quad,' consisting of the United States, Japan, Australia, and India. First convened in 2007, the Quad stalled and was 'abandoned' when Australia left the bloc in 2008. However, nearly a decade later, the four partners reconvened the dialogue in 2017 and have since met several times, the latest being in March 2021 to discuss cooperation on the Covid-19 pandemic.

For its part, Singapore appears somewhat more cautious towards the idea of the Indo-Pacific and its institutions. In 2018, Singapore's Foreign Minister Vivian Balakrishnan stated that Singapore would not join the Quad, as it was not adequately clear whether FOIP would center ASEAN in regional architecture and how such an initiative would benefit ASEAN and Singapore.[12] However, Singapore and ASEAN felt compelled to recognize the geostrategic imperative of the Indo-Pacific in 2019 by way of the 'ASEAN Outlook on the Indo-Pacific' (AOIP). The AOIP notes 'ASEAN centrality' as the 'underlying principle' for cooperation in the Indo-Pacific and aims to be an 'inclusive' initiative.[13] It further identifies four broad spaces for cooperation: maritime, connectivity, the United Nations Sustainable Development Goals (SDGs), and economics. The maritime vertical mentions security-related areas, such as preserving freedom of navigation, countering transnational crime and threats, and rules-based dispute settlement. The AOIP does not propose new mechanisms but rather existing ASEAN ones (such as the East Asia Summit and ASEAN Regional Forum) for cooperation. While the AOIP essentially aims to highlight ASEAN's 'central role' in anchoring the regional architecture, it is a normative document that allows for existing 'ambivalence' toward the Indo-Pacific within ASEAN member states.[14] As noted by Balakrishnan, the AOIP does not preclude ASEAN members from being drawn into different security orbits.[15] For Singapore, given the core nature of ASEAN in its foreign policy, the AOIP will remain the strategic outlook of the city-state toward the Indo-Pacific. However, as noted by Singaporean maritime security expert Collin Koh, in areas of strategic

[8] Haushofer, Karl. "*Geopolitik des Pazifischen Ozeans*", (Berlin: Kurt Vohwinkel, 1925)

[9] "Confluence of the Two Seas: Speech by H.E. Mr. Shinzo Abe, Prime Minister of Japan at the Parliament of the Republic of India", Ministry of Foreign Affairs of Japan, August 22, 2007, https://www.mofa.go.jp/region/asia-paci/pmv0708/speech-2.html

[10] "Indo-Pacific Strategy Report: Preparedness, Partnerships and Promoting a Networked Region", U.S. Department of Defense, June 1, 2019, https://media.defense.gov/2019/Jul/01/2002152311/-1/-1/1/DEPARTMENT-OF-DEFENSE-INDO-PACIFIC-STRATEGY-REPORT-2019.PDF

[11] "Acting Secretary of Defense Shanahan's Remarks as the IISS Shangri-La Dialogue 2019", U.S. Department of Defense, June 1, 2019, https://www.defense.gov/Newsroom/Transcripts/Transcript/Article/1871584/acting-secretary-shanahans-remarks-at-the-iiss-shangri-la-dialogue-2019/

[12] Yong, Charissa. "Singapore will not join Indo-Pacific bloc for now: Vivian", *The Straits Times*, May 15, 2018, https://www.straitstimes.com/singapore/spore-will-not-join-indo-pacific-bloc-for-now-vivian

[13] "ASEAN Outlook on the Indo-Pacific", ASEAN, June 23, 2019, https://asean.org/storage/2019/06/ASEAN-Outlook-on-the-Indo-Pacific_FINAL_22062019.pdf

[14] Ha, Hoang Thi. "ASEAN Navigates between Indo-Pacific Polemics and Potentials", *ISEAS-Yusof Ishak Institute*, April 20, 2021, https://www.iseas.edu.sg/wp-content/uploads/2021/03/ISEAS_Perspective_2021_49.pdf

[15] "Minister for Foreign Affairs Dr Vivian Balakrishnan's Written Reply to Parliamentary Question", Ministry of Foreign Affairs Singapore, August 5, 2019, https://www.mfa.gov.sg/Newsroom/PressStatements-Transcripts-and-Photos/2019/08/05-Aug_Min-Written-PQ-Reply.

"The safety and stability of the Indo-Pacific is certainly one such area of convergence, thereby underscoring that maritime security is a key area of cooperation."

convergence where the principles of other Indo-Pacific strategies (such as FOIP) align with its national interests, Singapore will accordingly seek cooperation without endorsing specific strategies or concepts.[16] The safety and stability of the Indo-Pacific is certainly one such area of convergence, thereby underscoring that maritime security is a key area of cooperation.

U.S.–Singapore Indo-Pacific maritime defense: prospects for cooperation

A change in the U.S. presidency usually presents an opportunity for America's allies and partners to reflect on relations and evaluate prospects for cooperation in areas of mutual interest. Broadly, the Trump Administration did not prioritize Southeast Asia in its foreign policy. Instead, Trump's Asia policy was preoccupied with issues related to China and North Korea. Although the administration did enact legislation and initiatives to spur economic development (the BUILD Act) and security (the Southeast Asia Maritime Security Initiative [SAMSI]), the president showed 'little genuine interest or regard' for the region skipping key ASEAN meetings.[17] For Singapore, bilateral relations remained stable, with the highlight being the 2018 Singapore Summit between President Kim and North Korean Supreme Leader Kim Jong-un.

Nonetheless, after the perceived volatility of the Trump Administration, Joe Biden's victory in the 2020 presidential election was viewed positively from a Singaporean perspective and a 'return' of sorts to the engaging nature of the Obama Administration. According to a 2021 'State of Southeast Asia' survey by Singapore's Institute of Southeast Asian Studies, Singapore's trust in the United States as a strategic partner and regional security provider has markedly increased from the previous year, likely attributable to the new U.S. administration.[18] Singapore's leaders also share a mostly favorable impression of President Biden. He had previously visited the county in 2013 as Vice-President and advocated for deepening cooperation between the two countries.[19] More importantly, the new president's foreign policy team includes many veteran experts with a wealth of experience on Asia who are equally well-regarded in Singapore and the region. Two notable appointments are Jake Sullivan as National Security Advisor and Kurt Campbell to the newly created role of 'Indo-Pacific Coordinator' on the National Security Council. Sullivan previously visited Singapore in 2018 on diplomatic/academic engagements and has been described by Vivian Balakrishnan as a 'good friend of Singapore' who is well-versed with the two countries' 'strong and robust cooperation over the years in the defense, security, and economic spheres.'[20] The appointment of Kurt Campbell, a former assistant secretary of state who played a part in Obama's 'Pivot to Asia' strategy, has also been well received by foreign policy experts in Singapore.[21][22] As such, it would not be beyond the pale to project a positive trajectory for future security cooperation, including in the maritime space.

While the general sentiment of an upward trend in maritime relations appears likely, the question remains as to how (or perhaps if) this would translate into concrete action. While it is yet early days for the Biden Administration, it can be speculated that prospects for maritime security cooperation at present would likely follow the line of 'more continuity than change.' Existing security deployments and exercises are expected to continue, albeit in modified formats, in the face of the logistical difficulties posed by the ongoing pandemic. This has already been seen in the case of the Carat Exercise in 2020, which was conducted in a hybrid format involving virtual and in-person activities and following health safety norms.

On the other hand, expanding cooperation is less certain, with the question often being asked- 'what more can be done?' Some experts have proposed that the new American administration pursue 'minilateral' cooperation using an 'ASEAN Minus X' formula whereby the Unites States and a few partner ASEAN countries could collaborate on areas of mutual interest; a relevant example being the trilateral SITMEX exercise launched in 2019 by Singapore, Thailand, and India.[23] However, the logistics and the appetite for such minilateral initiatives on the part of the United States and Singapore are not immediately clear.

Nonetheless, beyond their existing arrangements, the two sides could build on collaboration in combatting maritime terrorism/piracy and humanitarian assistance and disaster relief (HADR), both of which are incredibly pertinent to Southeast Asia. As Southeast Asia's most technologically advanced naval power, Singapore possesses competitive advantages in collaborating with partners like the United States to assist other Southeast Asian states. One area for such collaboration is promoting maritime domain awareness (MDA) in the region. Specifically, information about maritime threats is a critical aspect of maritime security. Singapore's National Maritime Security System (NMSS), set up in 2011, is a 'whole-of-government framework that monitors threats and coordinates action between the navy and coast guard and customs and immigration bodies.[24] The NMSS has been

[16] Koh, Collin. Personal communication with the author, 2021.
[17] Chong, Byron. "The Trump administration's record on Southeast Asia", *Observer Research Foundation*, September 23, 2020, https://www.orfonline.org/expert-speak/trump-administration-record-southeast-asia/
[18] Seah, Sharon, Hoang Thi Ha, Melinda Martinus, and Pham Thi Phuong Thao. "The State of Southeast Asia: 2021", *ISEAS-Yusof Ishak Institute*, February 10, 2021, https://www.iseas.edu.sg/wp-content/uploads/2021/01/The-State-of-SEA-2021-v2.pdf
[19] Hon, Chua Chin. "Deepen US-Singapore Cooperation: Biden", *The Straits Times*, July 26, 2013, https://www.straitstimes.com/singapore/deepen-us-singapore-cooperation-biden
[20] Vivian Balakrishnan, Facebook, February 17, 2021, https://www.facebook.com/Vivian.Balakrishnan.Sg/posts/10157448722806207
[21] Koh, Tommy. "The Biden administration: The road ahead for Asia", *The Straits Times*, January 21, 2021, https://www.straitstimes.com/opinion/the-biden-administration-the-road-ahead-for-asia
[22] Kausikan, Bilahari. "The Indo-Pacific after Donald Trump", *Nikkei Asia Review*, January 17, 2021, https://asia.nikkei.com/Opinion/The-Indo-Pacific-after-Donald-Trump
[23] Heydarian, Richard Javad. "Why Biden Should Pursue 'Minilateralism' with ASEAN", *Asia Maritime Transparency Initiative*, March 26, 2021, https://amti.csis.org/why-biden-should-pursue-minilateralism-with-asean/
[24] "Fact Sheet on Information Fusion Centre (IFC) and Launch of IFC Real-Time Information-Sharing System (IRIS)", Ministry of Defence Singapore, May 30, 2017, https://www.mindef.gov.sg/web/portal/mindef/news-and-events/latest-releases/article-

described as the 'best regional example' for sharing information and 'sense-making.' [2526] To that end, the Information Fusion Centre (IFC) of the Singapore Navy, launched in 2009, aims to 'facilitate information-sharing and collaboration between its partners to enhance maritime security.' [27] The IFC's focus areas are multinational collaboration and capacity, and confidence-building. Since its inception, it has hosted over 150 international liaison officers from several countries, including the United States. The IFC's Real-time Information Sharing (IRIS) system, which integrates its existing portals (such as the WPNS Regional Maritime Information Exchange), was also used in the 2019 U.S.–ASEAN maritime exercise. Given the increasing incidence and impact of piracy and transnational crime across Southeast Asia, information-sharing and MDA could be scaled up through co-investment and deployment of technologies spearheaded by Singapore and the United States. Together, the two partners could look to further bilateral cooperation on MDA and information sharing and assist in capacity-building for other ASEAN states, which would benefit all parties.

On account of its growing importance, the non-traditional security area of HADR is another area where there is an opportunity for enhanced U.S.–Singapore maritime cooperation in Southeast Asia and the broader Indo-Pacific. Maritime Southeast Asia has witnessed several grave natural disasters over the past few years, from the 2018 Palu earthquake in Indonesia (which had over 4,000 casualties) to yearly typhoons in the Philippines. Additionally, political-security developments have also triggered humanitarian crises with maritime security implications, such as the mass displacement of Rohingya refugees from Myanmar to several Southeast Asian countries in 2015. These incidents require quick, coordinated action from multiple partners to minimize the loss of life and mitigate damage. Here again, Singapore and the United States can collaborate to assist other partners, as in late April 2021, when the Singapore and U.S. navies deployed ships and aircraft to assist in search and rescue operations for the Indonesian submarine KRI-Nanggala 402, which sank in the Bali Sea.

Given that climate change and the ensuing disruptive weather patterns are projected to drastically increase the propensity of natural disasters across the Indo-Pacific, Singapore, and the United States should consider this a key area of cooperation in maritime security going forward. As with MDA, the technological capacities of the two sides can be leveraged here. In 2019, Singapore's Defence Science and Technology Agency (DSTA) and the U.S. DoD's Joint Artificial Intelligence Centre (JAIC) signaled a partnership to operationalize the use of artificial intelligence (A.I.) in HADR.[28] Such new-age technologies could act as capability multipliers by improving decision-making mechanisms and facilitating more efficient and effective responses.

Potential divergence

Despite the generally positive prospects for bilateral maritime security cooperation, the United States and Singapore diverge in strategic thinking on certain maritime issues. These issues are essential to understand in the context of future Indo-Pacific dynamics. Views on China's maritime security engagement in the region and expectations on the Indo-Pacific are examples of such divergence.

Any analysis of U.S.–Singapore Indo-Pacific dynamics is incomplete without accounting for the role of China, especially vis-à-vis Singapore. Beijing has unequivocally denounced the Indo-Pacific and its associated mechanisms as hostile and derided its veracity (in 2018, Chinese Foreign Minister Wang Yi notably discarded Indo-Pacific strategies as 'sea foam' that would dissolve in time).[29] Within the Indo-Pacific geography, the South China Sea (SCS) remains the predominant flashpoint for maritime security due to the longstanding territorial disputes between China and some ASEAN member-states. For its part, Singapore has traditionally sought to avoid positioning itself explicitly in either the American or Chinese security orbits, hedging between the two great powers to maximize interests. For instance, in 2018, Singapore (along with several ASEAN countries) participated in the inaugural China–ASEAN maritime exercise. The obvious fact remains that, as a small state with critical economic ties to China, Singapore can ill-afford to alienate Beijing as a player in regional security. Singapore has kept military relations with both Washington and Beijing on a somewhat even keel. In 2019, Singapore signed an Agreement on Defence Exchanges and Security Cooperation (ADESC) with China (matching the DCA signed with the United States in 2015). The ADESC both formalized bilateral defense ties across and elevated them through new areas of cooperation, including port calls, force visits, and training. The Chinese and Singapore navies have conducted the bilateral Exercise Maritime Cooperation since 2015. In early 2021, they also conducted another exercise in the SCS. On the SCS issue, despite not being a claimant to the disputes, Singapore, on principle, steadfastly supports adherence to international law, as it reiterated in 2016 when an Annex VII Arbitration ruled that China's claims are contrary to the United Nations Convention on the Law of the Sea (UNCLOS).[30]

At a deeper level, the issue of China in the context of U.S.–Singapore maritime relations can be understood as 'differences' in thinking and expectations from both sides in the Indo-Pacific. While the U.S.–Singapore partnership appears to be mostly clear-eyed, there is an occasional disconnect. An example of this occurred in late 2020 when

detail/2017/june/30jun17_fs4/!ut/p/z0/fY25DsIwEES_hSKltU7IUQcoAOWgCMi4QRZsiEOyAWyOz8ehoqIavdHTDEgQIEk99VlZPZDqHO9lfEjKxXzJw6Aoo8rn6a6qsmhWrLZJDGuQ_wW3ENzzeX4GeVW2YZrqAUTA_QRE-yAEMeUu_eRQm3C0dXu7yRTkcSCLbwui13TCmn2ZrMeboUePE74MU3Ri-HSt8XinLBrL7tihMuiK8cMbt539-3G9yP0mSycfqLPgQw!!/

[25] Felsens-Parsons, Brit, Sarah Fu, Kirara Nakamura, and Schoni Song, *Improving and Operationalizing Maritime Domain Awareness in the South China Sea* (New York: Columbia School of International and Public Affairs, 2020) 17.

[26] Ibid

[27] "Fact Sheet on Information Fusion Centre (IFC) and Launch of IFC Real-Time Information-Sharing System (IRIS) ," Ministry of Defence Singapore, May 14, 2019, https://www.mindef.gov.sg/web/portal/mindef/news-and-events/latest-releases/article-detail/2019/May/14may19_fs

[28] Parameswaran, Prashanth. "What's in the New US-Singapore Artificial Intelligence Defense Partnership?", *The Diplomat*, July 1, 2019, https://thediplomat.com/2019/07/whats-in-the-new-us-singapore-artificial-intelligence-defense-partnership/

[29] "Foreign Minister Wang Yi Meets the Press", Ministry of Foreign Affairs of the Republic of China, March 9, 2018, https://www.fmprc.gov.cn/mfa_eng/zxxx_662805/t1540928.shtml

[30] "MFA Spokesman's Comments on the ruling of the Arbitral Tribunal in the Philippines v China case under Annex VII to the 1982 United Nations Convention on the Law of the Sea (UNCLOS)", Ministry of Foreign Affairs Singapore, July 12, 2016, https://www.mfa.gov.sg/Newsroom/Press-Statements-Transcripts-and-Photos/2016/07/MFA-Spokesmans-Comments-on-the-ruling-of-the-Arbitral-Tribunal-in-the-Philippines-v-China-case-under

outgoing U.S. Navy Secretary Kenneth Brathwaite stated that the U.S. Navy intended to reactivate its decommissioned 1st Fleet to support the Pacific-focused 7th Fleet (which is overextended in its scope). Secretary Brathwaite further suggested that Singapore could be a potential base for the Fleet. These statements raised 'both eyebrows and questions' among local analysts and experts, and Singapore's Ministry of Defence quickly responded that it had not agreed on any deployments at its bases with the U.S. Navy beyond the four littoral combat ships already allowed.[31] Secretary Brathwaite later clarified that while a new fleet in the region made strategic sense, it would be of an 'expeditionary nature' and not directed at any particular country.[32] While this incident could be chalked down to a one-off in oversight or miscommunication, it equally perhaps underlines that the U.S.–Singapore relationship does have its limits. It is frequently noted that the two countries are not formal treaty allies. It has been reported that Singapore turned down an offer in the early 2000s to be a U.S. major non-NATO ally, opting instead for more 'strategic autonomy' through concentrated security ties.[33] These limits will be important to keep in mind as Indo-Pacific competition between countries like the United States and China continues and perhaps escalates in the future.

Despite some initial speculations that the Biden Administration would take an approach of 'competitive coexistence' with China, there are indications that it will continue, or even amplify, the harder outlook on the SCS that the Trump Administration operationalized.[34] American expectations of its security partners will be critical in such a scenario, especially as the Trump Administration took a much more transactional approach to its security relations. For example, the 2019 DoD strategy report mentions that the United States 'expects our allies and partners to shoulder a fair share of the burden of responsibility to protect against common threats.'[35] The Biden Administration's approach remains to be seen, though its own early rhetoric indicates it will return to its role as a 'multilateral team player.'[36] As the United States' pre-eminent Southeast Asian partner, these expectations and differences in thinking are critical for U.S.–Singapore maritime security cooperation. They need to be further evaluated going forward.

Conclusion

Five decades after diplomatic ties began, Singapore is America's primary Southeast Asian security partner. In the words of former INDOPACOM Commander Admiral Philip Davidson, 'no other Southeast Asian country has done more to facilitate U.S. presence than our partners in Singapore.'[37] The U.S.–Singapore security relationship was founded on the cornerstone of maritime security cooperation. Today, the rise of the 'Indo-Pacific' in geopolitics has precipitated a strategic rethinking of the maritime spaces that connect the two partners. In an Indo-Pacific world, the United States and Singapore are likely to sustain (or perhaps even elevate) cooperation, albeit with some divergence in thinking

"In an Indo-Pacific world, the United States and Singapore are likely to sustain (or perhaps even elevate) cooperation, albeit with some divergence in thinking."

[31] "Reply to Queries on U.S. SEC NAV's Calls for New U.S. 1st Fleet Out of Singapore", Ministry of Defence Singapore, November 18, 2020, https://www.mindef.gov.sg/web/portal/mindef/news-and-events/latest-releases/article-detail/2020/November/18nov20_mq
[32] Storey, Ian. "America's Proposed Reactivation of the 1st Fleet Raises Eyebrows and Questions".
[33] Huxley, Tim. "Singapore and the US: not quite allies", *The Strategist*, July 30, 2012, https://www.aspistrategist.org.au/singapore-and-the-us-not-quite-allies/
[34] Valencia, Mark J. "In the South China Sea, Biden is outdoing Trump in bluff and bluster", *South China Morning Post*, March 29, 2021, https://www.scmp.com/comment/opinion/article/3127180/south-china-sea-biden-outdoing-trump-bluff-and-bluster
[35] "Indo-Pacific Strategy Report: Preparedness, Partnerships and Promoting a Networked Region", U.S. Department of Defense.
[36] "Biden draws sharp contrast with Trump in presidential debut on world stage", *The Straits Times*, February 20, 2021, https://www.straitstimes.com/world/united-states/drawing-contrast-with-trump-biden-promises-us-allies-a-partnership-thats-not
[37] "Commander of United States Indo-Pacific Command Receives Prestigious Military Award", Ministry of Defence Singapore, April 16, 2021, https://www.mindef.gov.sg/web/portal/mindef/news-and-events/latest-releases/article-detail/2021/April/16apr21_nr

7

Singapore's bilateral relations with the United States and China: a historical refresher

Jarret Fisher

Abstract

Singapore maintains amicable relations with both the United States and China. This paper examines the early development of Singapore's bilateral relationships with both great powers, and argues that Singaporean foreign policy is neither ideological nor in service of world powers but rather pragmatic and self-oriented for survival. Due to this analysis, this paper recommends the United States do the following in support of its relationship with Singapore: 1) pursue a more active diplomatic engagement; 2) establish a U.S.-ASEAN Investment Promotion Committee in Singapore; 3) invest in the next generation of Singaporean and American leaders; 4) leverage core competencies to deepen collaboration on engaging third countries.

History of Singapore's relationship with the United States

Singapore became an independent nation on August 9, 1965. On August 11, 1965, the United States recognized the newly sovereign Singapore via a letter from Secretary of State Dean Rusk to S. Rajaratnam and opened its embassy on April 4, 1966. [1] Following Singapore's independence, the U.K. initially continued to guarantee its former colony's security and kept a sizeable deployment of troops there. However, the U.K. was significantly in debt after World War II and pared down its colonial commitments. On July 18, 1967, the U.K. announced its plans to withdraw troops and vessels from the island nation by the mid-1970s, which it completed early in 1971.[2] Meanwhile, in 1970, Singapore became a member of the Non-Aligned Movement and remains a member to this day, in theory maintaining a nonaligned foreign policy. In 1972, the U.S. Department of State issued a memo about Singapore's nonaligned status. It lauded it as the country's best play: "Small countries must at all costs avoid becoming too closely dependent on one great power or they run the danger of becoming the field for indirect great power competition."[3] Even though Singapore was nonaligned on paper, it leaned West in practice. It is indisputable that Singapore built itself as a democracy with a capitalist economy.

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In the 1960s, U.S. policy in Southeast Asia revolved around the containment of communism. U.S. policymakers believed the best way to make a country resilient against communist ideology was to guarantee its economic viability. For his part, Lee Kuan Yew was a vocal supporter of U.S. efforts in Vietnam because he believed democracy in Southeast Asia needed time to take root, and the United States' knotty eight-year (1965-1973) stint in Vietnam allowed Singapore to survive, thrive, and build resilience.[4] The stars aligned for Singapore; the United States sent its first mass of ground troops to Vietnam mere months before Singapore's independence. The United States Armed Forces set up a procurement office in Singapore in 1966 and used shipyards in Jurong for ship repair and refueling, developed by the British.[5] Singapore was closer to South Vietnam than other existing U.S. military bases in Asia, such as those in the Philippines and Japan. In 1966 alone, Singapore took export orders from the United States in South Vietnam amounting to 300 million Singaporean dollars, plus additional revenue brought to the island by American troops on combat leave.[6] The U.S. military's R&R program spurred growth for Singapore's tourism and hospitality industries. In 1966, U.S. military personnel traveling for R&R increased tourist traffic in Singapore by 31%.[7] By 1967, 15% of Singapore's total income came from U.S. military procurement for the Vietnam War.[8] Former Singaporean diplomat Bilahari Kausikan said of the importance of U.S. presence in Singapore throughout the Vietnam War, "these ten years were valuable. It gave us a big boost at a time when our economy was down and out. The British were withdrawing, and unemployment was running at 15%. During the Vietnam War, we were the logistics center. We sold the U.S. things. It was a lifeline."[9] Lee Kuan Yew and his contemporaries ensured Singapore's survival in its early years, yet the city-state also received a welcome economic boost from the Vietnam War.

Lee Kuan Yew's first visit to the United States was in October 1967, for two weeks. Lee visited Washington, D.C, New York City, Boston, St. Louis, Chicago, San Francisco, and Los Angeles.[10] On this visit, Lee formally invited the U.S. military to fill the void resulting from British withdrawal and encouraged American companies to invest in Singapore.[11] The fact that the U.S. Armed Forces relied on Singapore to great effect gave confidence to American businesses to invest there. The government of Singapore sweetened the pot with the Economic Expansion Incentive Act in 1967, reducing the corporate tax rate tenfold from 40% to 4% for export industries. It worked. Within months, Mobil Oil built an oil refinery in Singapore with an initial investment of US$35 million, and Caterpillar built a warehouse serving as its hub for Asia and Africa.[12] General Instrument and Westinghouse came to Singapore in 1968.[13] Besides direct investment, American companies brought jobs for Singaporeans. Unemployment in Singapore dropped from 15% in 1967 to 4% in 1972.[14]

Lee was gravely concerned about Singapore's majority Chinese populace retaining their Chinese identity. He was equally troubled that if Singapore was perceived as too close with the United States, the country would be labeled a puppet of America. Moreover, dissent among

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[2] Omar, Marsita. "British Withdrawal from Singapore." Infopedia. National Library Board Singapore, October 2020. https://eresources.nlb.gov.sg/infopedia/articles/SIP_1001_2009-02-10.html.
[3] Chua, Daniel. "American Containment and Singapore Survival." In *US-Singapore Relations, 1965-1975: Strategic Non-Alignment in the Cold War*, 58. Singapore: NUS Press, 2017.
[4] Ong Keng Yong. "Lee Kuan Yew's Role in Singapore-U.S. Relations." InAsia. The Asia Foundation, March 25, 2015. https://asiafoundation.org/2015/03/25/lee-kuan-yews-role-in-singapore-u-s-relations/.
[5] Chua, Daniel. "Activating Singapore's Economy." In *US-Singapore Relations, 1965-1975: Strategic Non-Alignment in the Cold War*, 174. Singapore: NUS Press, 2017.
[6] Ibid.
[7] Chua, Daniel. "Activating Singapore's Economy." In *US-Singapore Relations, 1965-1975: Strategic Non-Alignment in the Cold War*, 175. Singapore: NUS Press, 2017.
[8] Wen-Qing Ngoei. "Lee Kuan Yew's Singapore Bloomed in the Shadow of the Cold War." The Diplomat. Diplomat Media, March 28, 2017. https://thediplomat.com/2017/03/lee-kuan-yews-singapore-bloomed-in-the-shadow-of-the-cold-war/.
[9] Chua, Daniel. "Interplay of Containment and Non-Alignment." In *US-Singapore Relations, 1965-1975: Strategic Non-Alignment in the Cold War*, 25. Singapore: NUS Press, 2017.
[10] "PM Lee Kuan Yew Arrives in Washington D. C." History SG. Government of Singapore. https://eresources.nlb.gov.sg/history/events/54195c25-ae60-4d3c-868e-822d1eb5f5e9.
[11] Chua, Daniel. "Interplay of Containment and Non-Alignment." In *US-Singapore Relations, 1965-1975: Strategic Non-Alignment in the Cold War*, 22. Singapore: NUS Press, 2017.
[12] Chua, Daniel. "Activating Singapore's Economy." In *US-Singapore Relations, 1965-1975: Strategic Non-Alignment in the Cold War*, 183-184. Singapore: NUS Press, 2017.
[13] Ibid.
[14] Ibid.

Singaporeans could result in a triumphant return of the communist Barisan Sosialis.[15] Singapore could fall to communism. Southeast Asian leaders were just as concerned about domino theory as the U.S. government.[16]

History of Singapore's relationship with China

Even though Singapore and the People's Republic of China did not establish formal diplomatic relations until October 3, 1990, Singapore began a relationship with imperial China as soon as Singapore was founded as a crown colony in 1819. In 1842, Hong Kong became a British colony, and even two centuries prior, Singapore and Hong Kong had active ports. The two colonies ratcheted up trade with one another, and the increase in the flow of goods brought Chinese immigrants to Singapore. Most Chinese migrants came to Singapore in the 19th century as indentured servants, known as coolies.[17] The Chinese word 'kuli' means hard labor. By 1860, 60% of Singapore's population was Chinese, and today, 76% are of Chinese descent.[18] During World War II, both China and Singapore were occupied by the Japanese. When the war ended, China reverted to civil war, which ended in 1949 with Mao Zedong proclaiming the People's Republic of China on October 1. Even so, China was not recognized at the United Nations until 22 years later, in 1971.

In 1967, Singapore became a founding member of ASEAN, along with Indonesia, Malaysia, the Philippines, and Thailand. When Beijing was admitted to the United Nations, Singapore made the conscious decision to be the last ASEAN country to establish diplomatic relations with them by reason of three-quarters of the city state's population having Chinese ethnicity.[19] Lee explained, 'We had to avoid any suspicion that Singapore was influenced by kinship ties with China.'[20] Singapore did not want to be seen as a puppet of any larger country, especially China, the ancestral homeland of most of its citizens. Singapore's migrant population remained culturally and emotionally attached to where they came from. Lee Kuan Yew was concerned they would firmly hold onto their Chinese identity and wanted to direct these loyalties away from China and strictly toward Singapore. This provided an impetus for joining the Non-Aligned Movement. Singapore needed to stand on its own two feet while achieving economic and social stability without being overly dependent on any great power. Furthermore, Singapore was at the beginning of its nation-building journey in the 1970s. Lee wanted to establish a Singaporean identity, for citizens to see themselves as Singaporeans, rather than Chinese, Malay, or Indian.[21]

As part of Malaysia in the 1960s, Singapore did not have a relationship with China at all because the Chinese Communist Party (CCP) supported Indonesia's *Konfrontasi*, a series of military attacks against Malaysia, whose slogan was "Crush Malaysia."[22] As soon as Singapore became independent in August 1965, it resumed trade with China. This is surprising considering Lee openly despised communism as a threat to Singapore's existence. Nonetheless, Lee dealt with the world as it was, not how he preferred it to be, and survival was the government's guiding motivation for decades after independence. Although Singapore's relationship with China warmed after the Sino-Soviet split in the early 1960s, it did not blossom until after the Vietnam War. Singapore strongly supported the U.S. efforts to stave off communism in Vietnam, while China supported communist North Vietnam through military training and equipment provisions for 20 years.[23] U.S. troops left Vietnam in 1973, and Saigon fell in 1975. Singapore and China opened reciprocal trade offices in 1981, and direct flights began in 1985.[24]

The first visit of a senior Singaporean official to China was made by S. Rajaratnam in March 1975. This visit laid the groundwork for Lee Kuan Yew's visit in May 1976.[25] For a decade and a half thereafter, Lee visited China on an annual basis and conducted these visits in English. China's first high-level visit to Singapore was by Deng Xiaoping in November 1978. Deng was enamored by the young country's rapid and successful development. It was only after this visit that the Chinese government kickstarted its domestic economic reforms. They succeeded rapidly; in 1977, China's GDP stood at $175 billion U.S. dollars, and by 1980 it shot up to $306 billion U.S. dollars, a 75% increase in three years.[26]

In the early 1980s, Special Economic Zones were established in China, offering tax incentives to attract the foreign investment it now allowed. The Chinese government hired Goh Keng Swee, a former Deputy Prime Minister of Singapore, as an Economic Advisor. Goh played a key role in China's Coastal Development Strategy and in the growth of their tourism industry.[27] Deng Xiaoping singled out Singapore on his Southern Tour in 1992 as a model for reform. He stated, "Singapore's social order is good. Its leaders exercise strict management. We should learn from their experience, and we should do a better job than they do."[28] Lee agreed, and egged on Deng by proclaiming, "If Singaporeans, who are descendants of illiterate, landless peasants who had to leave China could do it, then China with is progeny of scholars, mandarins, and literati that stayed home can certainly do it."[29]

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[16] Choong, William. "China-US Relations: Singapore's Elusive Sweet Spot." *Perspective*, 80 (July 23, 2020).
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[21] Lye Liang Fook. "Singapore–China Relations: Building Substantive Ties Amidst Challenges." *Southeast Asian Affairs*, 2018, 321–40.
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[25] Zheng, Yongnian, and Liang Fook Lye. "Introduction." In *Singapore-China Relations: 50 Years*, xv. World Scientific Publishing Company, 2015.
[26] National Bureau of Statistics of China.
[27] Cai Haoxiang. "Dr. Goh Helped Shape China's Economy." Straits Times, May 19, 2010. https://www.asiaone.com/News/the%2BStraits%2BTimes/Story/A1Story20100519-217043.html.
[28] Kristof, Nicholas. "China Sees Singapore As a Model for Progress." The New York Times, August 9, 1992. https://www.nytimes.com/1992/08/09/weekinreview/the-world-china-sees-singapore-as-a-model-for-progress.html.
[29] Lye Liang Fook. "Singapore–China Relations: Building Substantive Ties Amidst Challenges." *Southeast Asian Affairs*, 2018, 321–40.

Following Deng's southern swing, more than 400 Chinese delegations visited Singapore in a single calendar year.[30] Between 1992 and 2011, at least 22,000 Chinese officials have traveled to Singapore on study visits and to take courses on public administration.[31]

In January 1995, the World Trade Organization was launched, a rules-based organization that regulates global trade. Singapore hosted the first-ever WTO Ministerial Meeting in December 1996. China was granted membership in December 2001, a significant turning point in its economic growth. Singapore and China's bilateral trade, between 1978 and 1990, expanded by 15% annually on average, and Singapore's exports to China in the same period increased by 22% annually on average.[32] From 2001 to 2007, bilateral trade grew by 26% annually on average.[33] Singapore recorded its first trade surplus with China in 2009 and has maintained a surplus ever since.

By 2021, the governments of Singapore and China will have seven joint projects, with Suzhou Industrial Park and Tianjin Eco-City being the largest.[34] Singapore also helped in developing the Chongqing Initiative on Strategic Connectivity, Guangzhou Knowledge City, Sichuan Innovation Park, Nanjing Eco High-Tech Island, and Jilin Food Zone.

In 1996, the Joint Council for Bilateral Cooperation (JCBC) was established, which further institutionalized Singapore-China bilateral relations. JCBC meets every October and is co-chaired by Singapore's Deputy Prime Minister and China's Vice Premier of the State Council.[35] Below the JCBC are a dozen other government and public-private Steering Councils and Working Groups, including the essential China-Singapore Investment Promotion Committee, which meets every December and is co-chaired by Singapore's Minister of Trade and Industry and China's Minister of Commerce.

Recommendations for U.S.-Singapore relations

The comparative historical overview of U.S.-Singapore and China-Singapore bilateral relationships reveals that Singapore's alignment policy is determined by pragmatism and survival, not by ideology or cultural/ethnic affinity. Even though the world order has transformed since 1965, Singapore's core foreign policy has not. It has remained rooted in non-alignment and in protecting its own security. Singapore is indifferent to ideology when pursuing trade and diplomatic relations. First Minister for Foreign Affairs, S. Rajaratnam, stated clearly in Singapore's second month of independence, "Singapore has chosen the path of non-alignment. The friendship between two countries should not be conditional on the acceptance of common ideologies, common friends, and common foes."[36] Singapore is pragmatic. It wants to be friends with as many countries as possible, including with the world's geopolitical powers—the United States and China. Singapore cannot survive in isolation because of its size, lack of natural resources, and trade dependence. Singapore prefers to engage with both Beijing and Washington on security issues and wants to avoid choosing sides.

One cannot fault Singapore for wanting to further cultivate its relationship with China and remain relevant to China's continued development, boasting a population and potential market of 1.4 billion people. China's 400-million-strong middle class is larger than the entire population of the United States.[37] China is in Singapore's physical neighborhood while the United States is not. Singapore is physically and culturally closer to China, yet Singapore has more in common with the United States: democracy, multiculturalism, free market economy, belief in peaceable standards of behavior in the global commons[38], encouragement of entrepreneurship, and close military collaboration. Former Ambassador of Singapore to the United States Chan Heng Chee asserted in a panel in June 2021, "We note the Biden administration has placed emphasis on [certain] values in foreign policy: democracy and human rights. We hope this policy will be handled with care and nuance. Countries in the region have different traditions and sensitivities. The last time the U.S. had a campaign to promote democracy and human rights was at the end of the Cold War. It carried the spirit of triumphalism and came across as cultural imperialism or cultural imposition."[39] The U.S. government should heed this perspective and accept that Singapore engaging with China does not mean it is any less committed to the United States.

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Recommendations

Pursue a more active diplomatic engagement

The Biden administration has repeatedly affirmed ASEAN centrality within its Indo-Pacific strategy, and Singapore is the heartbeat of ASEAN. The perennial challenge of U.S. foreign policy is aligning strategy with

[30] Zheng, Yongnian, and Liang Fook Lye. "Looking Back and Looking Forward." In *Singapore-China Relations: 50 Years*, 22. World Scientific Publishing Company, 2015.
[31] Buckley, Chris. "In Lee Kuan Yew, China Saw a Leader to Emulate." Sinosphere. The New York Times, March 23, 2015. https://sinosphere.blogs.nytimes.com/2015/03/23/in-lee-kuan-yew-china-saw-a-leader-to-emulate/.
[32] Tong, Sarah. "Resilient and Enduring Bilateral Economic Relations." In *Singapore-China Relations: 50 Years*, 54-55. World Scientific Publishing Company, 2015.
[33] Ibid.
[34] Zheng, Yongnian, and Liang Fook Lye. "Introduction." In *Singapore-China Relations: 50 Years*, xvi. World Scientific Publishing Company, 2015.
[35] Ibid.
[36] Chua, Daniel. "American Containment and Singapore Survival." In *US-Singapore Relations, 1965-1975: Strategic Non-Alignment in the Cold War*, 36. Singapore: NUS Press, 2017.
[37] Rubin, Trudy. "400 Million Strong and Growing: China's Massive Middle Class Is Its Secret Weapon." The Seattle Times, November 16, 2018. https://www.seattletimes.com/opinion/400-million-strong-and-growing-chinas-massive-middle-class-is-its-secret-weapon/.
[38] Self-coined phrase as alternative to "rules-based international order," which is the preferred terminology in the United States, but explicitly disliked by other countries such as China and Russia.
[39] *U.S.-Singapore Relations at 55: Our Shared Past and Future. Facebook*. Lee Kuan Yew School of Public Policy, 2021. https://www.facebook.com/nuslkyspp/videos/338837654470382.

resources. The Biden Administration has to put more dollars and personnel behind its policy. Six months into his presidency, on July 29, 2021, President Biden nominated Jonathan Kaplan to be the next U.S. Ambassador to Singapore. Kaplan was confirmed as the next U.S. Ambassador to Singapore on November 19, 2021. This was a welcome nomination and relatively swift confirmation, as the United States had not had an Ambassador in Singapore since Kirk Wagar left in January 2017. Singapore is too important a partner for the United States to have left this ambassadorship empty for nearly five years.

Two high-level U.S. government officials have visited Singapore thus far during the Biden Administration. Secretary of Defense Lloyd Austin visited Singapore July 26-28. He met with Minister of Defence Ng Eng Hen, Prime Minister Lee Hsien Loong, and delivered the Fullerton Lecture at IISS. Chief of U.S. Naval Operations Admiral Mike Gilday joined Secretary Austin in Singapore, where he met with Defense Minister Ng Eng Hen, Chief of Defense Force Lt. Gen. Melvyn Ong, and Chief of Navy Rear Adm. Aaron Beng.[40] Admiral Gilday also attended the International Maritime Security Conference. Vice President Kamala Harris visited Singapore at the end of August 2021 and discussed regional security, climate change, and COVID-19 with Singaporean officials. President Biden should sustain this high-level U.S. diplomatic engagement and make a state visit to Singapore before long.

Establish U.S.-ASEAN Investment Promotion Committee in Singapore

ASEAN as a bloc is the fifth-largest economy after the United States, China, Japan, and Germany, and Singapore is the financial capital of Southeast Asia.[41] To match China's institutionalization of its relationship with Singapore, a U.S.-ASEAN Investment Promotion Committee should be established. Singapore can offer to provide secretariat services and host annual meetings at the Minister of Commerce level.

Invest in the next generation of leaders

In Singapore, there will soon be a changing of the guard from the third to the fourth generation of political leaders, from current Prime Minister Lee Hsien Loong to a younger Prime Minister. This should make Singapore's fifth and sixth generations of political, cultural, and business leaders a priority for the United States to cultivate ties and promote common views on the rule of law and collective security. The U.S. government should invest in engaging the next generation of Singaporeans to advance mutual trust and confidence. Programs that provide opportunities for next-generation Singaporeans and Americans to meet, exchange ideas, and discuss bilateral, regional, and global issues should be promoted. The Young Southeast Asian Leaders Initiative (YSEALI), a set of exchange programs and capacity-building courses for emerging leaders aged 18-35, is a step in the right direction. The Asia Reassurance Initiative Act of 2018 authorized "$25,000,000 to be appropriated for each of fiscal years 2019 through 2023 to support Indo-Pacific young leaders initiatives, including YSEALI and other people-to-people exchange programs."[42] President Biden should double funding for YSEALI in his next budget proposal, which will be for fiscal year 2023. This would allow YSEALI to initiate additional programs on other issues (e.g., dialogue on regional security, model U.S.-ASEAN Summit, youth forums, and workshops) that are more than just capacity-building on development issues. In addition to YSEALI, the U.S. government should also increase funding for the International Visitor Leadership Program (IVLP) and Study of U.S. Institutes (SUSI), two other initiatives that bring Singaporeans to the United States.

Similarly, the U.S. government must ensure young Americans study and appreciate Singapore. More American students, at the undergraduate and graduate levels, and policymakers from Congress and the Executive branch need to travel to Singapore to study firsthand the bilateral relationship, use it as a base to study ASEAN, and Asia policy at large. Currently, Singapore is not a Boren-eligible country, though it should because students can learn Mandarin Chinese and Malay in Singapore. There is only one Fulbright award per year for Open Study/Research in Singapore, yet there should be at least four such awards in Singapore per year for Americans. American graduate policy students should target NUS's Lee Kuan Yew School of Public Policy and NTU's Rajaratnam School of International Studies. Beyond U.S. government scholarships to study at these institutions, there should be private-sector-funded endowments for American students at both schools.

Leverage core competencies to deepen collaboration on engaging third countries

The United States and Singapore can also deepen collaboration on engaging third countries. The U.S.-Singapore Third Country Training Program (TCTP) under the Mekong-U.S. Partnership provides training to government officials from Cambodia, Laos, Myanmar, Thailand, and Vietnam, in Singapore, on cybersecurity, trade facilitation, smart cities, and intellectual property rights. TCTP should be open to all ASEAN member states and should add training on the rule of law and maritime domain awareness, among other topics that can leverage U.S. and Singaporean expertise.

Conclusion

The United States should focus on what it has in common with Singapore and make those pillars resilient. Singapore's preference of 'not choosing a side' is a welcome

"Singapore's preference of 'not choosing a side' is a welcome wake-up call for U.S. foreign policy broadly; none of our relationships or alliances should explicitly counter China."

[40] "CNO Visits Singapore, Speaks at IMSC and Highlights Cooperation." Press Releases. U.S. Navy Office of Information, July 28, 2021. https://www.navy.mil/Press-Office/Press-Releases/display-pressreleases/Article/2709854/cno-visits-singapore-speaks-at-imsc-and-highlights-cooperation/.

[41] "ASEAN's Economy." US-ASEAN Business Council, July 22, 2019. https://www.usasean.org/why-asean/asean-economy.

[42] "Text - S.2736 - 115th Congress (2017-2018): Asia Reassurance Initiative Act of 2018." Congress.gov. Library of Congress, December 31, 2018. https://www.congress.gov/bill/115th-congress/senate-bill/2736/text.

wake-up call for U.S. foreign policy broadly; none of our relationships or alliances should explicitly counter China. If the United States pressures its friends and treaty-allies to treat China as an enemy, it will have the opposite effect and risk isolating the United States. Washington is receiving this message; in June 2021, President Biden asserted, "U.S. foreign policy is not against any particular country, but *for* the American people."

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