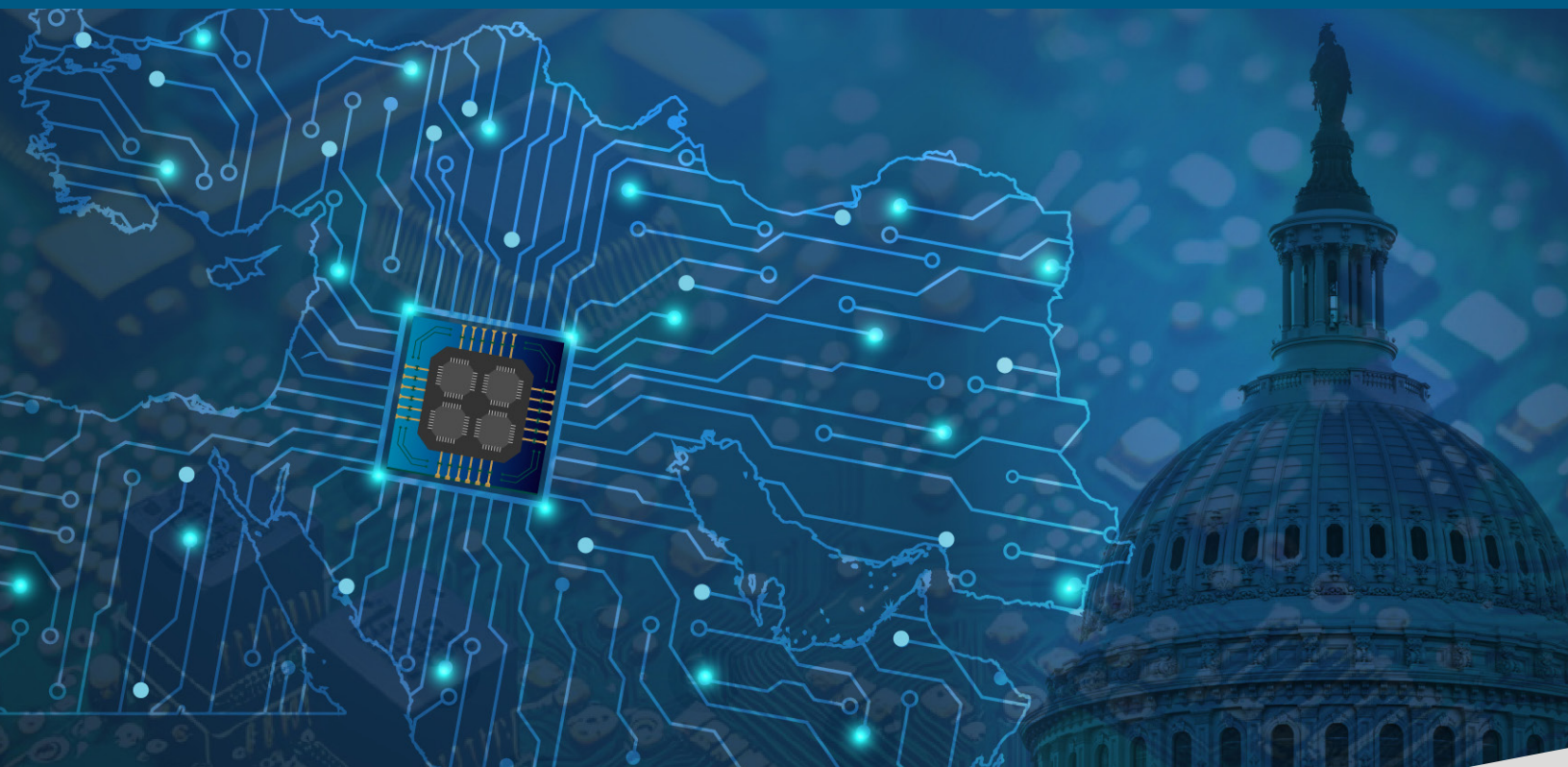




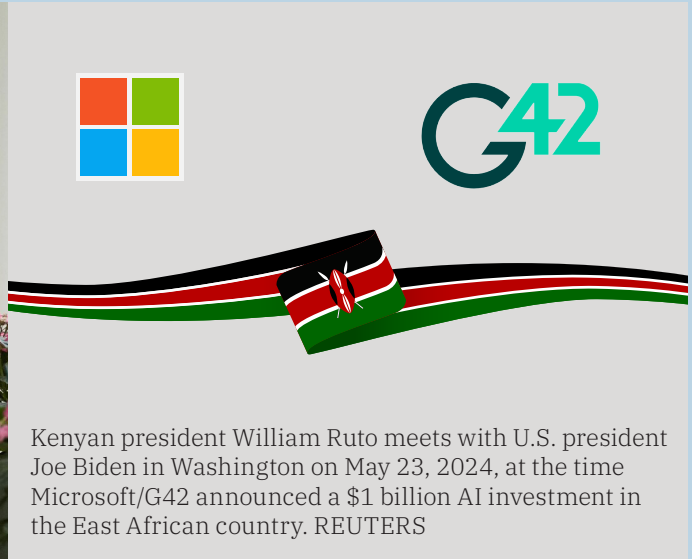
## Semiconductors, AI, and the Gulf Policy Considerations for the United States

Elizabeth Dent and Grant Rumley



### Executive Summary

In May 2024, during a state visit by Kenyan president William Ruto to Washington DC, the Microsoft Corporation and Group 42 Holding (G42)—an artificial intelligence firm based in the United Arab Emirates—announced a massive \$1 billion deal to invest in technology infrastructure in Kenya, including a green data center, AI local-language development research, an innovation lab, international and local connectivity efforts, and safe and secure cloud services.<sup>1</sup> The Kenya-based collaboration between Emirati and American companies may seem out of place to some, but it is part of a much larger U.S. effort to harness the power of technological partnerships and compete with China on a range of emerging technologies, including AI.



Kenyan president William Ruto meets with U.S. president Joe Biden in Washington on May 23, 2024, at the time Microsoft/G42 announced a \$1 billion AI investment in the East African country. REUTERS

The deal represents both the promise and peril of public-private technological partnerships between the United States and other countries in the current era of great power competition. Weeks after its announcement, the Microsoft-G42 partnership itself encountered serious turbulence. In July, members of the U.S. House Select Committee on the Chinese Communist Party and the U.S. House Foreign Affairs Committee demanded a briefing from the intelligence community on G42's ties to China, long a concern for officials in Washington.<sup>2</sup> Later that month, committee staff members were refused meetings with Emirati officials during a visit to the region.<sup>3</sup> Shortly thereafter, sources on Capitol Hill and within Microsoft hinted at plans to scale back the partnership with G42.<sup>4</sup>

The G42 saga is a microcosm of the dilemma facing Washington as it seeks to balance its quest to bolster technological partnerships with its desire to prevent advanced proprietary information and technology from reaching its adversaries. At the center is a debate surrounding the U.S. policy on exporting advanced semiconductors, or chips, to Middle East countries. These chips are the linchpin of all modern advanced computing and thus are increasingly sought by countries that cannot produce their own. In the Middle East, especially the Gulf, the demand for chips to power local initiatives in advanced

computing and AI is skyrocketing—as is the desire to manufacture advanced chips. Yet many would-be purchasers of advanced U.S. chips have longstanding ties to China, which presents American policymakers with a conundrum.

Navigating this new reality requires a clear export policy from Washington, which has four broad options to consider when contemplating chip exports to the Gulf:

**1. Remove export controls on advanced chips.**

The United States could allow the global market to operate freely and avoid placing export controls on its advanced chips. Such a policy, however, would involve a great deal of risk that adversaries will gain access to proprietary U.S. technologies and thus is unlikely to be implemented.

**2. Require a license, but presumptively allow export of all advanced chips.** The United States could require a license application from prospective purchasing countries of advanced U.S. chips, with the presumption of acceptance pending certain assurances. Such assurances, however, would not remove the inherent risk to proprietary U.S. technology. This option would add a bureaucratic gatekeeper to the process but would likely be well-received by many in the Gulf.

**3. Require a license, but presumptively deny export applications absent certain safeguards and compliance requirements.** The United States could require a license but also require prospective purchasing countries to maintain specific standards to protect U.S. technology, with license applications denied absent such steps. This would require a continuous assessment of adherence to the standards. It could also be combined with an overall cap on advanced chip exports to select entities, as is reportedly under discussion in Washington.<sup>5</sup> Some Gulf states might perceive this as an infringement on their sovereignty and consider turning to alternative suppliers, possibly U.S. adversaries. Private companies could do the same.

**4. Ban exports of advanced chips to the Gulf.** This approach, more restrictive than the second and third options, may in fact be unfeasible given U.S. ties to countries in the region. However, it would in effect maximize the security of proprietary U.S. technologies.

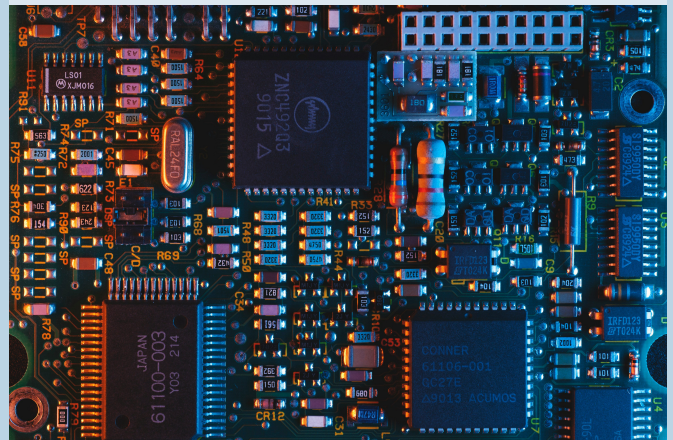
In weighing these options, this study recommends several policy ideas for U.S. consideration, including:

- Protecting proprietary information by clarifying specific safety and security requirements for chip exporters
- Using chip exports as leverage to limit recipient countries' relationships with U.S. adversaries like China
- Ensuring close cooperation between the legislative and executive branches on proposed public-private partnerships and advanced chip exports
- Implementing a “known entity” list of companies that abide by stringent export standards
- Ensuring a full interagency review process for chip exports to the Middle East

By considering these steps, the United States will be better positioned to navigate the turbulence sure to accompany advanced technological partnerships in this era of great power competition.

### Abbreviations

AIATC	Artificial Intelligence and Advanced Technology Council (UAE)
AMD	Advanced Micro Devices
ASIC	application-specific integrated circuit
ATRC	Advanced Technology Research Council (UAE)
BIS	Bureau of Industry and Security (U.S.)
CPU	central processing unit
FDPR	foreign direct product rule
FMS	Foreign Military Sales
FPGA	field-programmable gate array
G42	Group 42 Holding
GPU	graphics processing unit
LEAP	Leading Edge Advancement and Progress
LLM	large language model
MDP	major defense partner
SMIC	Semiconductor Manufacturing International Corporation (China)
SoC	system-on-a-chip
TSMC	Taiwan Semiconductor Manufacturing Company
VEU	validated end user





## U.S. Chip Policy to Date

The United States has been the global leader in advancing design innovation for semiconductors—colloquially known as chips—since the development of the point-contact transistor in 1947 and the junction transistor in 1948, both of which were invented by Americans.<sup>6</sup> The semiconductor industry exploded with the invention of the bipolar integrated circuit in the United States in 1959, marking a new era for digitization and establishing Silicon Valley as the hub for companies pursuing chip innovation.<sup>7</sup> In the ensuing years, engineers discovered ways to build smaller, more lightweight chips with integrated circuits that could perform multiple functions and process vast amounts of data across millions of tiny components. Today, chips are used in nearly all aspects of everyday life: they power computers and smart devices, help advance medical instruments and patient care, and even control the temperature in people's homes.

The United States has a qualitative competitive edge in the chip design industry, with companies like Nvidia and Advanced Micro Devices (AMD) continuing to push the boundaries of computational performance.<sup>8</sup> These companies have rolled out the most high-powered chips in recent years and found markets in machine-learning algorithms like those required to power artificial intelligence, self-driving cars, and cryptocurrency mining.<sup>9</sup> The companies and their partners also offer comprehensive data center solutions and maintain robust software ecosystems, aiming to offer reliable and complete solutions for computing at scale.

Quantitatively, however, the United States is not a leading chip manufacturer. According to one 2020 industry report, the United States has only a 10 percent share of total chip manufacturing worldwide, with China (22%), Taiwan (18%), Japan (17%), and South Korea (16%) rounding out the top five.<sup>10</sup> With logic chips, Taiwan accounts for 35 percent of global production, followed by

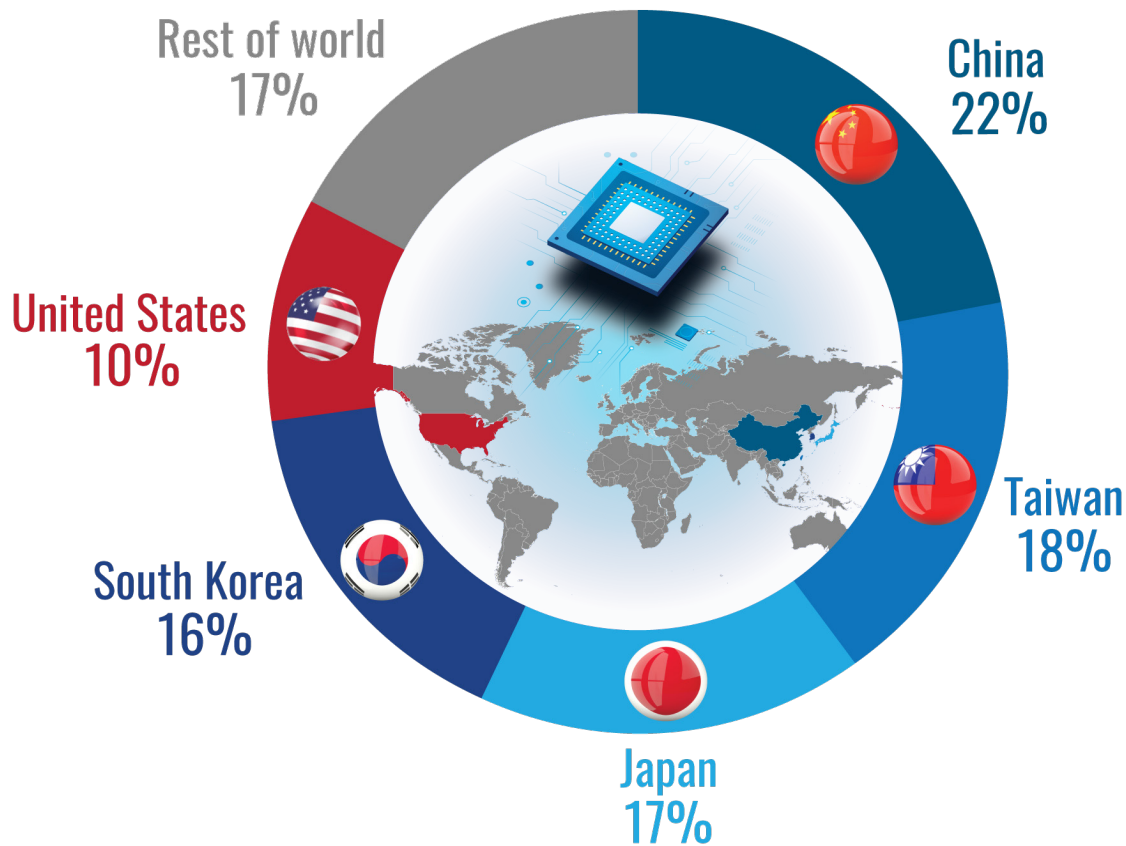
China (23%), the United States (13%), South Korea (8%), and Japan (7%).<sup>11</sup> For many years, the United States has relied heavily on Taiwan to manufacture these advanced chips, largely because of the quality and importance of chips—which make up about 15 percent of Taiwan's GDP—to the country's economy.<sup>12</sup> Indeed, according to one estimate, Taiwan Semiconductor Manufacturing Company (TSMC) has a 90 percent share in the global market for the most advanced chip.<sup>13</sup>

In recent years, reliance on Taiwan for a critical resource has revealed a vulnerability for the United States. As China becomes increasingly aggressive in the Indo-Pacific, and specifically toward Taiwan, a bipartisan consensus has emerged in Washington on the need to fortify the U.S. chip supply chain. This consensus has taken on new momentum as China has sought to similarly fortify its own supply chain and advance its chip technologies to match and even surpass those of the United States.<sup>14</sup> As the competition between Washington and Beijing accelerates, production of advanced technologies and access have emerged as another theater in the race.

Both the first Trump administration and the Biden administration have had a particular focus on securing these advanced chips in an effort to maintain a technological edge over China. In 2019, the Trump administration banned the Chinese telecommunications giant Huawei from buying advanced American technological supplies without explicit permission and from placing its equipment in U.S. telecommunications networks.<sup>15</sup> U.S. officials have worried for years that Huawei could use its equipment for espionage.<sup>16</sup> Given the company's reliance on U.S. suppliers and its reputation as an affordable option, the move was clearly an attempt to stifle Huawei's supply chain and cut off its burgeoning U.S. market. In May and August of 2020, the U.S. Department of Commerce issued additional export controls on Huawei, blocking it



## Total Chip Manufacturing by Location: 2020

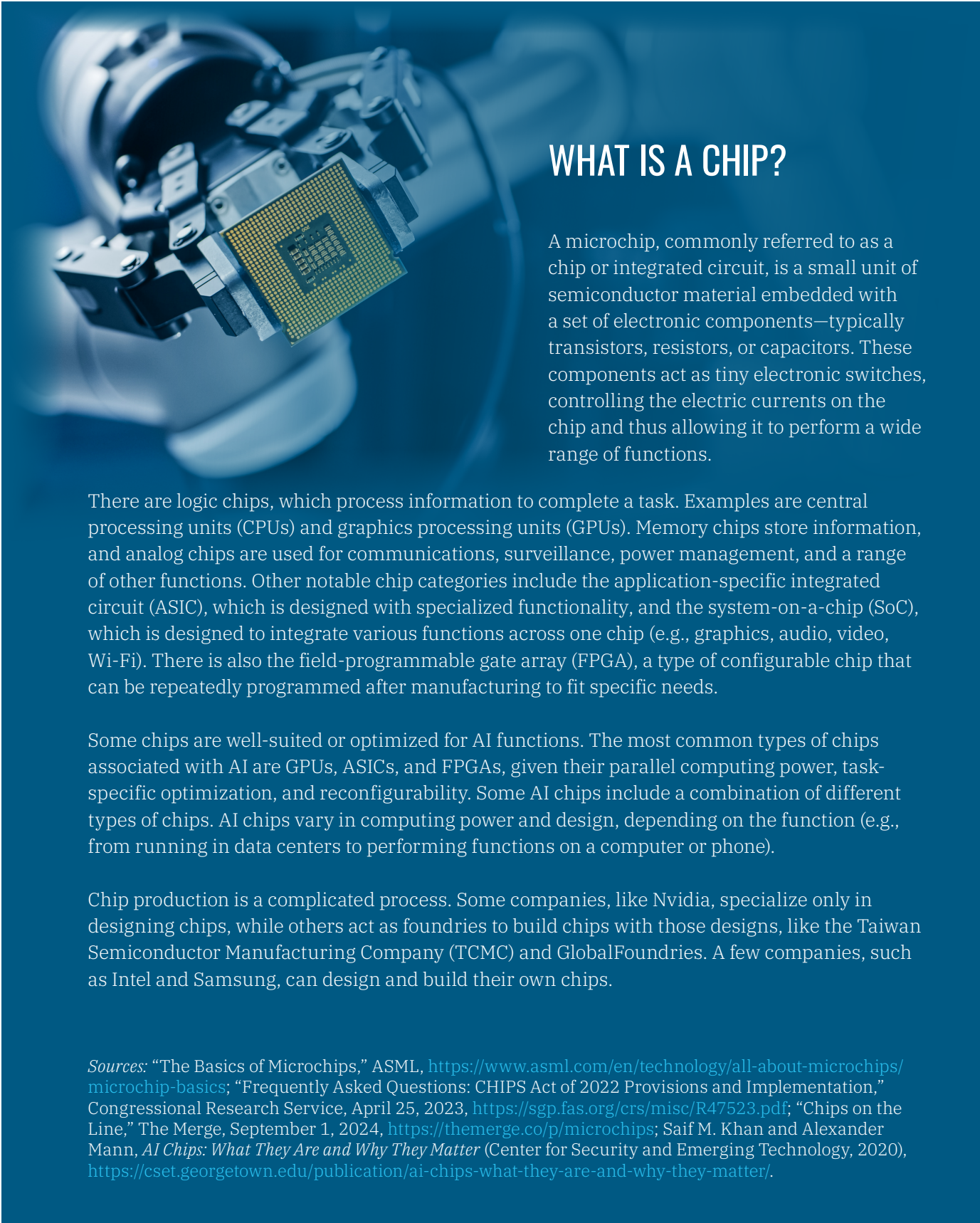


Source: Alice B. Grossman, Karen M. Sutter, and Emily G. Blevins, *Semiconductors and the Semiconductor Industry* (Congressional Research Service, 2023), <https://crsreports.congress.gov/product/pdf/r/r47508>.

from using American-made software or machinery without a license, and in December 2020, it placed similar restrictions on China's Semiconductor Manufacturing International Corporation (SMIC).<sup>17</sup> In doing so, however, the Trump administration exacerbated the strain on the global chip supply chain during the Covid-19 pandemic, as companies switched to alternative producers. Automakers like Ford, Subaru, and Toyota were forced to curb production at plants across the United States, Germany, and other countries and limit chip installation to vehicles with the highest profitability.<sup>18</sup> In at least one case, an automaker that moved chip production from SMIC found its new supplier, TSMC, could not keep up with demand.<sup>19</sup>

The Biden administration has broadly continued the Trump administration's strategy regarding advanced technology, and its focus has been threefold: increasing domestic production of advanced chips, restricting China's access to advanced chips, and limiting the spread of technologies that could enable China to produce advanced chips domestically. As National Security Advisor Jake Sullivan reiterated in 2023, "We are protecting our foundational technologies with a small yard and high fence."<sup>20</sup>

Increasing production at home was the impetus behind the bipartisan CHIPS and Science Act of 2022, which includes \$39 billion for manufacturing



## WHAT IS A CHIP?

A microchip, commonly referred to as a chip or integrated circuit, is a small unit of semiconductor material embedded with a set of electronic components—typically transistors, resistors, or capacitors. These components act as tiny electronic switches, controlling the electric currents on the chip and thus allowing it to perform a wide range of functions.

There are logic chips, which process information to complete a task. Examples are central processing units (CPUs) and graphics processing units (GPUs). Memory chips store information, and analog chips are used for communications, surveillance, power management, and a range of other functions. Other notable chip categories include the application-specific integrated circuit (ASIC), which is designed with specialized functionality, and the system-on-a-chip (SoC), which is designed to integrate various functions across one chip (e.g., graphics, audio, video, Wi-Fi). There is also the field-programmable gate array (FPGA), a type of configurable chip that can be repeatedly programmed after manufacturing to fit specific needs.

Some chips are well-suited or optimized for AI functions. The most common types of chips associated with AI are GPUs, ASICs, and FPGAs, given their parallel computing power, task-specific optimization, and reconfigurability. Some AI chips include a combination of different types of chips. AI chips vary in computing power and design, depending on the function (e.g., from running in data centers to performing functions on a computer or phone).

Chip production is a complicated process. Some companies, like Nvidia, specialize only in designing chips, while others act as foundries to build chips with those designs, like the Taiwan Semiconductor Manufacturing Company (TSMC) and GlobalFoundries. A few companies, such as Intel and Samsung, can design and build their own chips.

*Sources:* “The Basics of Microchips,” ASML, <https://www.asml.com/en/technology/all-about-microchips/microchip-basics>; “Frequently Asked Questions: CHIPS Act of 2022 Provisions and Implementation,” Congressional Research Service, April 25, 2023, <https://sgp.fas.org/crs/misc/R47523.pdf>; “Chips on the Line,” The Merge, September 1, 2024, <https://themerger.co/p/microchips>; Saif M. Khan and Alexander Mann, *AI Chips: What They Are and Why They Matter* (Center for Security and Emerging Technology, 2020), <https://cset.georgetown.edu/publication/ai-chips-what-they-are-and-why-they-matter/>.

incentives in the United States, \$13.2 billion for research and development, \$2 billion for using legacy chips in existing systems, and \$500 million for international chip supply chain activities, while also providing a 25 percent tax credit “for capital expenses for manufacturing of semiconductors and related equipment.”<sup>21</sup> This effort was intended to ensure that the U.S. advanced chip supply chain remains secure while also increasing overall U.S. competitiveness in the global market. According to one industry association, the U.S. share of global semiconductor production is projected to rise from its current level of approximately 10 percent to 14 percent by 2032.<sup>22</sup>

In addition to building up U.S. capabilities, Washington has sought to limit Beijing’s access to advanced chips and the technologies that could allow China to produce them domestically.<sup>23</sup> In 2022, the Commerce Department announced a wave of export controls surrounding high-end chips, focused on restricting transactions involving such chips as well as controls on “certain semiconductor manufacturing items” that could end up in China.<sup>24</sup> In August 2023, the Biden administration enacted an executive order to restrict outbound investments in “sensitive technologies and products” in “countries of concern,” specifically China.<sup>25</sup>

In October 2023, the Commerce Department went further, tightening existing export controls on advanced chips to prevent workarounds like purchasing smaller AI chips to combine them into more powerful chips, and limiting exports to countries likely to pass the technology on to China.<sup>26</sup> In March and September 2024, the department rolled out even more export controls to target laptops containing advanced chips, quantum computers and components, advanced chip-making tools, additive technology related to metals and metal alloys, and high-performance chips.<sup>27</sup> And in September 2024, Commerce unveiled a new

validated end user (VEU) system that would allow countries in parts of the Middle East and Central Asia to apply for licenses for advanced chips, provided their data centers work with Washington to meet U.S. standards.<sup>28</sup>

The Biden administration is considering new, stricter export controls on chip-production technologies in the final months of its term. The president is reportedly considering applying the foreign direct product rule (FDPR) to companies to prevent Chinese access to U.S. semiconductor technology, which would allow the U.S. government to impose controls on foreign-made products that use even minuscule amounts of U.S.-origin components or U.S. technology.<sup>29</sup> The aim here would be to require foreign companies, like Europe’s ASML and Japan’s Tokyo Electron, to adhere to the same restrictions U.S. companies face when selling products to China. Reports about the possibility of new export controls caused semiconductor producers’ shares and manufacturers’ stocks to dip in July 2024 as shareholders wrestled with the possible impact on sales.<sup>30</sup>

The second Trump administration will almost certainly continue the policies of the first. Trump himself has pointed a finger at Taiwan for “stealing” U.S. chip production, stating, “We should have never let that happen.”<sup>31</sup> He also caused shares of TSMC to fall in July 2024 after publicly questioning why the United States was acting as Taiwan’s insurer against China, and suggested Taipei should be paying Washington to defend it.<sup>32</sup> The remarks, along with reports that the Biden administration was considering activating the FDPR, caused a broader slump in the market, led by a decrease in chip company stocks that continued throughout July.<sup>33</sup> In the coming years, U.S. administrations are likely to continue the policies set by the Trump and Biden administrations to protect U.S. proprietary information, manufacturing jobs, and sensitive technology.



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## The Demand for Chips in the Gulf

The U.S. focus on limiting China's access to advanced chips and hindering advanced Chinese domestic production has created tensions between Washington and its Middle East partners. The Gulf Arab states, particularly the UAE and Saudi Arabia, are increasingly pursuing new and emerging technologies as part of their national development strategies, with a focus on artificial intelligence. Gulf countries especially see AI as a key to enabling more efficient government and private-sector operations. They also see the global technological landscape shifting more and more toward AI, and therefore want to position their economies to capitalize on this. One report by PricewaterhouseCoopers estimated that AI could add more than \$15 trillion to the global economy by 2030, of which approximately \$320 billion could be gained by countries in the Middle East. In particular, the report predicted AI-related technologies could contribute more than 12 percent of Saudi Arabia's GDP and 14 percent of the UAE's GDP by 2030.<sup>34</sup>

As this trend continues, the cornerstone of the U.S. relationships with each of the Gulf states—which for the last twenty years has been security and counterterrorism cooperation—will need to evolve for the United States to remain strategically competitive. Other countries, especially China, are poised to offer alternatives for Gulf countries to pursue their AI ambitions, often with fewer strings attached. As militaries become more reliant on emerging technologies for warfare, the next step for U.S. relations with each Gulf country may very well depend on Washington's ability to provide the technology necessary for deepening security and economic cooperation and integration. As was made clear by the visit to Washington by UAE president Sheikh Muhammad bin Zayed (MbZ) in September 2024, trade and advanced technology cooperation tops the Emiratis' agenda.<sup>35</sup>

As countries seek to move into this new era,

advanced technology initiatives will likely top their priority lists in bilateral discussions. Indeed, many of the Gulf states have already reconfigured government agencies to place their pursuit of advanced technologies at the center of governance. The UAE, for example, has created the world's first minister of state for AI and released a strategy to become the global AI leader by 2031.<sup>36</sup> The strategy has a wide range of objectives, to include: building a reputation as an AI destination, increasing the UAE's competitive assets in priority sectors through development of AI, bringing world-leading research capability to work with target industries, and proving the data and supporting infrastructure essential to becoming a test bed for AI.<sup>37</sup> The UAE's AI strategy is nested within and aligned with the UAE Centennial 2071 plan, which is focused on improving the country's reputation and soft power through four key pillars: a future-focused government, excellent education, a diversified knowledge economy, and a happy and cohesive society.<sup>38</sup> The UAE clearly views AI development and strategy as central to its 2071 goals, and as necessary priorities for both national security and economic growth.

The UAE has already made strides in its AI strategy: its development and release of the Falcon large language model (LLM) in 2023, thought to be one of the best open-source LLMs at the time, put the Emirates on the map in terms of training models. To develop it, the UAE brought in a team of twenty-five computer scientists from around the world and funded it through the Advanced Technology Research Council (ATRC), which in November 2023 launched the AI services and solutions company AI71, tasked with commercializing Falcon LLM and exploring multi-domain operations.<sup>39</sup> Earlier this year, the UAE also formed the Artificial Intelligence and Advanced Technology Council (AIATC) to “develop and implement policies and strategies related to research, infrastructure and investments in AI and advanced technology,” with Sheikh Tahnoun bin Zayed serving as chair.<sup>40</sup> The UAE's commitment to

the development and funding of a global commercial technology hub is, at the moment, unmatched in the region.

For its part, Saudi Arabia in its “Vision 2030” document similarly calls for the country to “focus on innovation in advanced technologies and entrepreneurship” and to “increase our investments in, and lead, the digital economy.”<sup>41</sup> In July 2020, the National Strategy for Data and AI was approved by King Salman, which commits Saudi Arabia to act as an AI development enabler for the first five years, build a foundation in niche markets as a specialist by 2030, and become an industry leader in the international economy beyond 2030 throughout the education, government, healthcare, energy, and mobility sectors.<sup>42</sup> Saudi Arabia had previously announced plans to invest \$100 billion in emerging technology and earlier this year launched Alat, a technology and AI firm, with the intent to grow its technology sector.

In March 2024, the *New York Times* reported that the kingdom was ready to create an additional \$40 billion fund to invest in AI, which would make it the world’s largest investor in the technology.<sup>43</sup> The fund would focus on start-ups or create its own companies to develop AI, produce chips, and build the data centers required to power computing. In a bid to attract global investors and new technology initiatives, the kingdom also began hosting an annual conference called LEAP, or Leading Edge Advancement and Progress, in 2022.<sup>44</sup> For the past two years, LEAP has been the world’s most widely attended technology conference, with more than \$10 billion in deals inked there this year alone.<sup>45</sup> On the heels of LEAP 2024, Aramco Digital and the Groq AI group announced plans to build the world’s largest inferencing data center in the kingdom.<sup>46</sup> In October 2024, the kingdom’s Public Investment Fund and Google Cloud announced a major deal to build an AI hub in eastern Saudi Arabia, which it projects will add \$71 billion to the kingdom’s GDP within the next decade.<sup>47</sup>

Chips are critical for powering and training these AI tools, and demand from countries like the UAE

and Saudi Arabia can be expected to increase exponentially as they seek to diversify economically by building indigenous AI capabilities and streamlining their technology sectors. While the United States remains the global leader in designing the most advanced chips—and is seeking to reenergize and expand their production—increased demand from the Middle East, along with increased export controls and regulation, will likely cause Gulf governments to turn to other markets to meet their growing demand.

The UAE is already in discussions with OpenAI, the firm leading the charge to raise \$5–7 trillion for an initiative to bolster global chip-building capacity, which also consulted the U.S. government to ensure buy-in.<sup>48</sup> Earlier this year, Saudi Arabia also announced plans to become a leader in the chip-manufacturing industry. In June, it launched the National Semiconductor Hub, a tech venture capital fund with \$266 million aimed at establishing fifty semiconductor design companies and attracting twenty-five experts to train five thousand engineers in semiconductor design by 2030.<sup>49</sup> The kingdom is also reportedly in discussions with the U.S. government on how to adhere to security standards to enable the export of advanced chips in its pursuit of AI.<sup>50</sup>

The United States has a twofold dilemma: it must balance its desire to maintain strong partnerships with countries around the world—in particular in places like the Gulf—with its need to protect its technology from China, and it must advance its domestic chip industry in a global marketplace that features ever more chip producers. The expansion of global chip production could cause the U.S. competitive edge in the market to eventually decrease or disappear altogether. However, the United States, as an industry leader, must also contend with how to protect this sensitive technology as well as its national security interests while remaining strategically competitive and the partner of choice for many countries in the Middle East. As evidenced by the last few years, this will be a difficult tightrope to walk.

## Case Study: The G42 Saga

Earlier this year, the Emirati technology giant G42 made headlines in the United States. In January, then Rep. Mike Gallagher (R-WI), chairman of the House Select Committee on the Chinese Communist Party, wrote a letter to Secretary of Commerce Gina Raimondo stating that G42 and its subsidiaries maintain extensive ties to China, presenting national security concerns for the United States. He added that G42 should be considered for inclusion on the Department of Commerce’s Bureau of Industry and Security (BIS) Entity List.<sup>51</sup> U.S. officials were concerned that in addition to G42’s ties to China, the firm was on the cusp of deepening ties with U.S. companies.

The BIS Entity List is a repository of the people, companies, and organizations all over the world on which the United States imposes the most stringent export-control restrictions, unless the exporter secures a license or an exemption.<sup>52</sup> G42 and many other Gulf-based companies in critical fields are often run by members of the royal family. In this instance, Tahnoun bin Zayed (TbZ), the UAE’s national security advisor and brother of the president, is chairman of the board.<sup>53</sup> Thus, placing G42 and its subsidiaries on the Entity List would not just be a matter of restricting exports to those companies, but might also affect the overall stability of the U.S.-UAE relationship.

G42’s ties to China are well documented. Its CEO, Peng Xiao, was previously CEO of the Pegasus subsidiary of the DarkMatter Group, another UAE company that was accused of serious privacy infringements. Prior to taking the helm at G42, Xiao signed a deal between Pegasus and the Chinese telecom firm Huawei.<sup>54</sup> During the Covid-19 pandemic, Xiao signed an agreement between G42 and the Chinese company BGI Genomics, which was blacklisted by the U.S. Defense Department in 2021 as an official Chinese military entity.<sup>55</sup> As the House Select Committee noted in its letter to the

Commerce Department: “Xiao operates and is affiliated with an expansive network of UAE and [China]-based companies that develop dual-use technologies and materially support PRC military-civil fusion and human rights abuses.”<sup>56</sup>

Although G42 consistently denied that China-based companies had access to its proprietary information, the U.S. government was unconvinced. The Biden administration, for its part, wanted to remain closely engaged with the Emiratis to prevent their ties with China from deepening. The issue was reportedly a top White House priority in its engagements with the UAE throughout 2023.<sup>57</sup> The concern for the United States was simple: deeper technological ties between the UAE and China inherently put proprietary U.S. information at risk. In the competition for critical technologies, maneuverability for countries like the UAE, which want relationships with both China and the United States, is limited.

By December 2023, it appeared G42 was changing course when Xiao announced at a conference that the company “cannot work with both sides,” and thus “we have to make a choice.”<sup>58</sup> In February 2024, G42’s investment arm announced it had “divested all its investments in China.”<sup>59</sup> Two months later, G42 announced it had reached an agreement with Microsoft whereby the latter would invest \$1.5 billion in G42 to expand AI in the Emirates and countries around the world.<sup>60</sup> The deal included a seat on the G42 board for Microsoft’s vice chair and president Brad Smith and was apparently blessed by both the U.S. and UAE governments.<sup>61</sup> G42 and Microsoft then announced a \$1 billion joint venture to invest in Kenya on the eve of a White House visit by the Kenyan leader.<sup>62</sup> The abrupt turnabout by G42, the UAE’s largest AI endeavor, struck many as a turning point in the technological competition in the UAE.

Yet turbulence arrived soon after the deal was announced. In July 2024, Bloomberg revealed



that Lunate, another UAE investment firm that likewise reports to TbZ, would take on G42's China investments.<sup>63</sup> Also that month, the House Select Committee on the Chinese Communist Party and the House Foreign Affairs Committee issued a joint letter to the White House demanding an intelligence review of the ties between G42, as well as "its subsidiaries and affiliates," and China.<sup>64</sup> Days after issuing the letter, Select Committee members visited Saudi Arabia and the UAE to discuss technology and China, but their meetings in the Emirates were canceled at the last moment at the request of the Emirati ambassador to Washington.<sup>65</sup> A few days later, Politico reported that Microsoft intended to scale back its plans to share sensitive technologies with G42.<sup>66</sup>

The White House appears to have alleviated broader U.S. government concerns about G42 after MbZ's visit to Washington in September 2024. During the visit, the United States and UAE released a joint statement underscoring the significant progress made in deepening cooperation on emerging technologies, particularly AI.<sup>67</sup> Emirati officials believe they have been successful in convincing the United States that they take Washington's concerns seriously and intend to uphold the standards laid out by the Biden administration. G42 has repeatedly insisted its safeguards for

protecting U.S. information are top-of-the-line, and Emirati officials have pointed to reports indicating they are taking stringent measures like banning Chinese nationals and equipment from data centers and repeatedly testing facility access.<sup>68</sup>

However, the G42 saga underscores the primary dilemma for the United States in navigating the technological aspect of this competition. A company or country may seek to keep its technological collaboration with China cordoned in one sector, but the nature of China's overseas practices makes that an increasingly difficult feat. Despite pledges of closeness to the United States, the Emirati leadership has also maintained a close economic and technological relationship with China, doing so while implementing enough safeguards to assuage U.S. concerns. The issue for the UAE, and others around the world, is that the level of safeguards the United States seeks for these types of deals is only likely to rise. There is bipartisan consensus in Washington, echoed in both the Trump and Biden administrations, that maintaining a technological advantage over China will remain a top priority. Therefore, the United States will have very little tolerance for countries looking to have it both ways: maintaining significant ties to advanced Chinese firms and simultaneously enjoying similar access to U.S. technologies.



The Emirati president, Muhammad bin Zayed, visited Washington in September. His talks with President Biden were aimed in part at allaying U.S. concerns about AI cooperation. REUTERS

## Considerations for the United States

In deciding how to apply its chip export policies to the Middle East, Washington must balance the demands from its longtime partners in the region with its desire to maintain a competitive technological edge against China. The United States has set performance-based thresholds for chips that are subject to export controls and require a license for export to certain countries, including the Gulf states.<sup>69</sup> Technological safeguards and re-export parameters will continue to be the highest priority for U.S. officials in the future. Middle East countries that seek access to advanced U.S. chips will likely have to subject themselves to rigorous U.S. oversight, which may in turn exacerbate tensions. As noted earlier, the United States has four broad options in navigating this landscape:

### 1. Remove export controls on all advanced chips.

This is the riskiest policy in terms of protecting U.S. interests, but the most forward-leaning from a commercial standpoint.

### 2. Require a license, but presumptively allow exports.

The United States here would provide its most advanced chips to partners and firms abroad after approval of a license application. Through the course of the application, the prospective purchasing country might be required to make pledges to safeguard U.S. technology. However, this route does not directly create oversight and enforcement mechanisms to ensure that the purchaser protects U.S. technology. This option adds a level of bureaucratic security to the process of accessing advanced U.S. chips, but it does not include aggressive measures to secure the technologies against potential adversaries. It would likely be well received by prospective purchasers, in particular in the Gulf.

### 3. Require a license, but presumptively deny applications absent certain safeguards and compliance requirements.

The United States in this scenario would require a license and also require prospective purchasing countries to meet specific standards to protect U.S. technology. This would require continuous assessment of compliance. It could also be combined with an overall cap on the export of advanced chips to recipient entities.<sup>70</sup>

This policy would place a premium on maintaining the U.S. technological edge over adversaries while still attempting to appease partners and allies on some level. It would likely achieve the former, but is unlikely to fully achieve the latter. For some countries in the Middle East, this policy would come across as the United States infringing on their sovereignty or private companies' operations. Some might be satisfied with access to chips despite the additional regulations, but others might be frustrated and turn to alternative suppliers, including China.

### 4. Limit exports of advanced chips altogether to partners and entities in the region.

This policy would effectively result in a ban on advanced U.S. technologies to the Middle East and would almost assuredly lead countries to turn to China for their chips. It would be the safest policy in terms of protecting proprietary U.S. technological information, but would come at the cost of many relationships with countries in the region.

The best option for the United States and its partners is clearly the third, provided the recipient country is willing to work with Washington on safeguards and oversight. Ultimately, the key factor in choosing one of these options will be the recipient's receptivity to U.S. concerns and Washington's confidence in the country's ability to protect U.S. information.

## Policy Recommendations

While the United States continues to promote deals like the G42/Microsoft investment in Kenya, it will eventually need to contend with the fact that its restrictions may prevent U.S. companies from keeping associated commitments, such as delivering advanced chips quickly. Further, expanding U.S. restrictions on chips will eventually place rising global demand at odds with U.S. production and export limitations. The alternatives will include chips from companies like Huawei, which have less computing power, are more prone to outages, and have higher energy costs, but come with fewer restrictions than U.S. alternatives.

Technologies like semiconductors and artificial intelligence will remain the future of global industry. The production and export of chips is a linchpin in the U.S. ability to compete globally—and particularly with China—on emerging technologies. G42’s agreement with Microsoft to curb ties with China and Chinese companies like Huawei in exchange for investment funding and partnerships like the one announced in Kenya could be seen to reflect an Emirati desire to pursue the United States, not China, as its partner of choice. Indeed, the financial commitments the UAE and G42 have made to secure the deal with Microsoft suggest this may be the case. And with the CHIPS and Science Act, the United States also appears to be pursuing an expansion of the chip industry in India, which may tie in with the UAE’s recent elevation to major defense partner (MDP) status following MbZ’s visit in September.<sup>71</sup> Only India had previously been granted MDP status, but the U.S. designation of the UAE to allow for greater defense ties could open the door to increased technological cooperation, particularly on chips, among the three countries.<sup>72</sup>

To remain the partner of choice for the UAE, other Gulf states, and countries around the world,

Washington must craft a policy that allows semiconductors to be sold and shipped to countries where the United States is pursuing major deals, like the G42/Microsoft deal in Kenya, while accounting for technology security concerns. The United States can remain strategically competitive in the Middle East, and specifically in Arab Gulf states seeking to take advantage of the chip boom, by taking the following steps:

- **Lay out explicit cybersecurity and chip export standards to protect U.S. national security and technology infrastructure.** Publishing a declassified fact sheet while simultaneously holding frank conversations behind closed doors with U.S.-based companies and foreign partners—in addition to the iterative process already used by policymakers to approve export licensing—will help ensure buy-in from these companies on protecting U.S. interests as well as their own.
- **Use chip exports as leverage to shape a recipient country’s relationship with China.** The United States holds a qualitative edge in one of the world’s most sought-after commodities. Middle East countries, especially those with financial resources and a desire to shape their future economies, are desperate for advanced chips. The United States could offer these chips with certain conditions that extend beyond cybersecurity concerns to cover a country’s overall relationship with China. This could mean requiring a recipient country to set up a mechanism for screening Chinese investment in sensitive areas, much like the Committee on Foreign Investment in the United States, or limiting ties between China and regional sovereign wealth funds. Given the nature of these chips—i.e., constantly being upgraded and



requiring replacement or maintenance every few years—the United States will be positioned to have a continuous channel of influence with a recipient country.

- **Ensure buy-in from the U.S. legislative and executive branches for major technological initiatives in the region.** Given the sensitivities associated with advanced technologies and competition with China, the United States must ensure that major deals and initiatives are conducted in consultation across the U.S. government. This means informing Congress well in advance of plans to share sensitive technologies. Failure to do so would jeopardize the long-term viability of initiatives, as partners might grow frustrated that the United States is seemingly relitigating previously agreed-upon arrangements.

The United States could also consider adopting a system similar to the Foreign Military Sales (FMS) program, which has a tiered review process ahead of each proposed sale. This process provides an informal notification to select committees on Capitol Hill, allowing them to hear the administration’s justifications for a proposed sale while airing their concerns. Administrations have historically honored the FMS tiered review process, including holds on potential sales, in order to ensure a level of support. A similar system would allow Congress to have a say in major technological deals while minimizing potential turbulence after a deal is announced.

- **Create a “known entity” or “trusted entity” list to allow countries and companies to bypass the licensing process while meeting U.S. safety and security thresholds.** The reverse of the BIS Entity List—which designates countries or entities that require a restrictive approach—this list would be part of a continuously vetted system for countries and companies that agree to meet specific U.S. standards in order to avoid the

elusive, stringent licensing process. This type of listing could speed up deals and the delivery of advanced technology while also supporting U.S. efforts to remain strategically competitive in both the manufacture and production of chips. This system would offer the flexibility of a tiered system, whereby the most advanced chips are reserved for the most trusted U.S. partners, which have committed to protecting American technology.

- **Ensure implementation of a full interagency process for specific policies on chip exports to Middle East countries.** These discussions would include policymakers and experts who cover China, the Middle East, emerging technology, and export controls to provide government buy-in at every level of the executive branch specifically. Clear, concise policy guidance should then be distributed to relevant stakeholders to ensure consistent and streamlined talking points and engagement across the U.S. government with foreign partners, particularly those seeking an influx of chips from the United States.

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## Conclusion

In September, Semafor reported that the UAE’s G42 firm had started to receive advanced Nvidia chips from the United States.<sup>73</sup> The UAE took extreme measures to prepare for receipt of the chips, building new data centers with Western-made hardware to ensure there was no Chinese backdoor, stripping older data centers of parts with ties to China, installing military-grade encryption at the new centers, and banning Chinese nationals from entering. The UAE then hired U.S. government contractors to inspect the data centers’ defenses and ensure their safety. Only then was the company allowed to start gaining access to some of the most advanced Nvidia H100 chips.<sup>74</sup>

For countries in the Middle East and beyond, this is likely to be the model for advanced technological collaboration with the United States. As the G42 saga underscores, countries with deep technological ties to China will have to clear a high bar to persuade U.S. policymakers that they can protect sensitive information. And Washington, for its part, will need to work internally to make sure its messaging to potential recipients about U.S. concerns is clear and consistent.

Ultimately, chips are yet another front in the U.S.-China competition. The United States, both to better position itself in this competition economically and to remain the primary partner of choice in its

bilateral relationships, must find a balance between a protective approach and one that advances its economic and security interests. Washington's strength lies in its global network of allies and partners, which it should endeavor to treat as equals in this competition, in contrast to China's approach to its own partnerships. One way to do this is to share more of the crown jewels of U.S. technology. If countries demonstrate a willingness to protect their own technological information as well as Washington's, the United States should lean forward and provide them the means to advance their own industries and economies. The future of U.S. relationships will require that it focus on balancing risk mitigation rather than defaulting to risk aversion. ❖

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