Economic Competitiveness and U.S. Tech Regulation: Assessing the Potential Impacts

PART 2 OF 2

Leading in the development of the next generation of technologies—including semiconductors, artificial intelligence (AI), quantum computing, robotics, and 5G—will play a crucial role in determining the U.S.'s future economic position globally. In the coming decades, these technologies are projected to play an integral role in unlocking billions of dollars in market value, securing cyberspace,[1] and shaping outcomes in hybrid warfare.[2] The AI industry alone is expected to increase its value to $1.3 trillion by 2029, over four times its valuation today.[3] The U.S. is currently the global leader in developing semiconductors and AI, but China is rapidly catching up and has already overtaken the U.S. in the development of 5G technology.[4] Meanwhile, legislative developments by the EU, India, and China seek to privilege their domestic tech industries while sidelining the major U.S. tech companies.

Against this backdrop, the U.S. Congress is currently considering a package of legislative proposals that would enact broad new regulatory requirements on select U.S. tech companies in an effort to foster and enable greater domestic competition within the sector. While this is an overall objective, several provisions within the tech-focused bills could unintentionally impact U.S. competitiveness internationally. These provisions, if passed in their current form, could also affect innovation in emerging technologies by potentially curbing major tech platforms' investments in research and development (R&D), disincentivizing venture capital (VC) investment, and restricting how U.S. firms compete against other major multinational tech companies.

The following analysis, produced by FP Analytics with support from the Computer Communications Industry Association (CCIA) — a trade organization that represents technologies, explores key provisions under consideration and potential impacts. The stakes are high, and policymakers have the opportunity to further consider the provisions as they work to craft regulations that boost competition, maintain competitiveness, and address national security amid intensifying geostrategic competition.

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ISSUE 1

The decline in federal R&D spending in certain emerging technologies has made the U.S. increasingly reliant on R&D from major U.S. tech platforms to drive innovation in these fields

RELEVANT SECTIONS OF PROPOSED LEGISLATION

- *Ending Platform Monopolies Act (H.R. 3825) Section 2 (b) (1), Section 2 (b) (2) (A, B)*

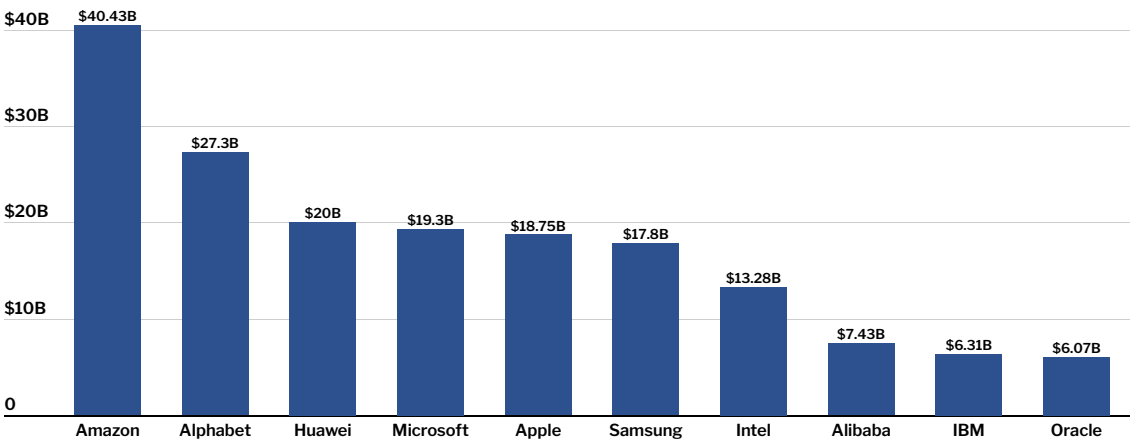
Potential risks introduced: Limiting the ability of the leading U.S. tech companies to invest in R&D could significantly constrain the tech sector's ability to innovate, and it could provide an advantage to global competitors in the development of a range of next-generation technologies, from artificial intelligence to quantum computing.

Potential economic competitiveness implications: As federal R&D spending in the U.S. has declined steadily over the past fifty years,[5] the private sector has filled the gap and become the primary source of funding for U.S.-based innovation. Today, the private sector conducts 75 percent of total research and accounts for 72 percent of all development spending.[6] The five largest tech companies in the U.S. have been responsible for an increasing share of tech-focused private sector R&D over the past decade.[7] In 2020,[8,9] these companies spent over $126 billion on R&D, accounting for more than 20 percent of total U.S. private-sector R&D spending across all industries.[10,11] As federal R&D investments have declined, major tech platforms have taken on higher risk and made decades-long investments, akin to those historically funded through the government. For example, the largest tech firms currently invest up to 20 percent of annual revenue in R&D,[12] allowing them to finance projects such as building quantum processors that take decades to develop.[13] Some of these projects have reached technological milestones that include completing a task estimated to take 10,000 years on a supercomputer in less than four minutes,[14] and creating new breakthroughs in quantum physics.[15] However, most are still not commercially profitable. Undertaking these types of investments in the private sector—ones that are not immediately profitable but are essential for long-term innovation—often requires resources from large companies that are able to generate revenue from other lines of business. Section 2 in the proposed Ending Platform Monopolies Act that place restrictions on major tech companies' ability to invest in business lines outside of their core operations could

Top 10 Tech R&D Spenders Worldwide

As of 2020, seven out of the top ten R&D spenders in the tech industry globally are U.S. companies, which have collectively spent $131.44 billion.

SOURCE: TECHNEWS



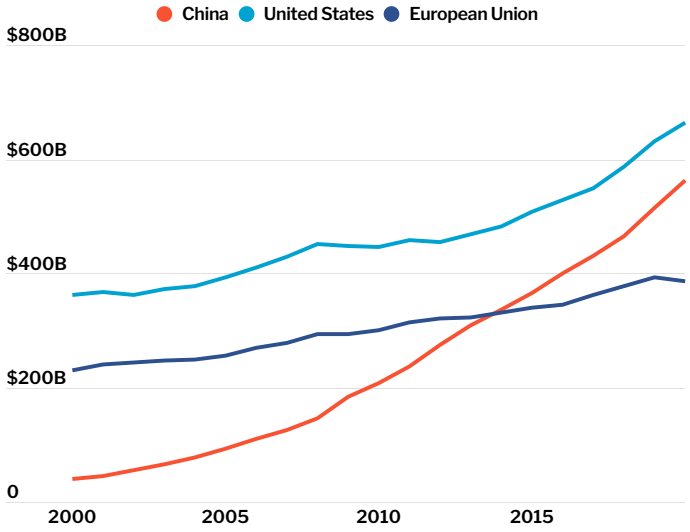
limit their investment in R&D and ultimately their capacity to develop these types of high-risk, cutting-edge technologies.

A significant reduction in tech companies' contribution to R&D financing would curtail overall U.S. spending on innovation—just as other countries, notably China, are expanding investments into advanced tech sectors. In the early 2000s, China accounted for only 5 percent of global R&D spending. Since then, it has been rapidly catching up to the U.S., accounting for roughly 24 percent of global R&D expenditure as of 2019, compared to the U.S.'s roughly 30 percent.[16] The Chinese government has played an increasingly involved and critical role, investing heavily in emerging tech sectors. In 2017, China released its New Generation Artificial Intelligence Development Plan backed by commitments from regional governments to invest nearly $30 billion in AI development.[17] The government has re-affirmed this approach in its most recent five-year plan, identifying quantum computing, AI, and nanoelectronics as national priorities.[18] The plan also laid out a strategy for establishing more national laboratories and upgrading existing national engineering and technology innovation centers.[19] The U.S. does not have a similar comprehensive government strategy currently in place to fund these types of emerging technologies[20] and instead relies on a decentralized mix of contributions from the government, the private sector, and academia.[21]

The Chinese government also provides significantly more incentives for private-sector R&D spending, including generous subsidies[22] and tax deductions ten times greater than the U.S. currently offers.[23] Such focused support has enabled China to surpass the U.S. in the development of 5G telecom technologies. As China's stated goal is to achieve full technological independence,[24] it is intensifying its state-led innovation strategy. Among China's planned initiatives are pledged investments of $118 billion over the next five years to bolster efforts to develop a self-sufficient semiconductor industry.[25] The U.S. still leads the world in semiconductor research and market share,[26] but China now produces nearly a quarter of all semiconductors—more than twice as many as the U.S.[27] China also leads the world in other areas critical to technological innovation, including high-tech manufacturing and exports,[28] and the number of Ph.D. graduates in science, technology, engineering, and mathematics (STEM).[29] Continual R&D investment from private-sector tech companies, alongside the government and academia, will be crucial to maintaining and advancing the U.S.'s overall capacity to develop emerging technologies. Enacting regulatory restrictions without adequately accounting for their impact on private-sector investment could lead to significant losses in R&D funding,[30] and undercut the U.S.'s competitive position in the development of next-generation technologies.[31]

Real Gross Domestic Expenditures on R&D

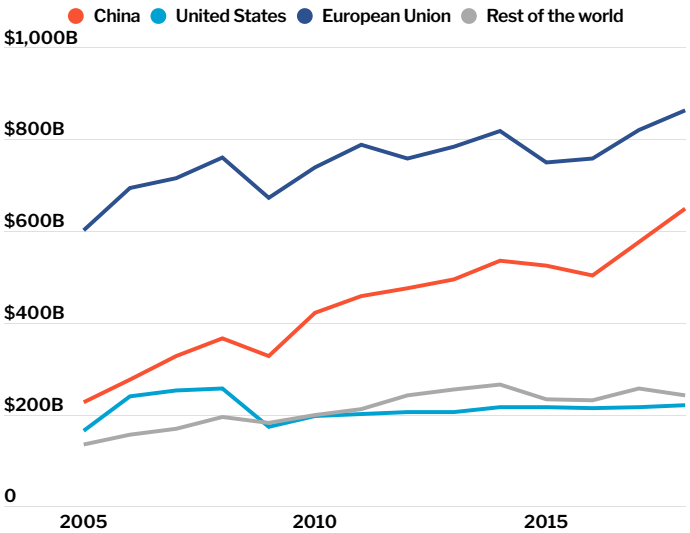
Since 2000, Chinese R&D spending increased by 1,315 percent. Although U.S. and Chinese R&D investments continue to rise, China is catching up to the U.S.



SOURCE: ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT (OECD)

Exports of High R&D Intensive Products by Country

In 2018, global exports of high R&D-intensive products, such as aircrafts, electronics, pharmaceuticals, and optical products, were $2.8 trillion. The U.S. has the largest trade deficit in such products among major economies.



SOURCE: NATIONAL SCIENCE FOUNDATION (NSF) SCIENCE & ENGINEERING INDICATORS

ISSUE 2

U.S. tech startups rely on acquisitions by major tech companies with significant investment funds to attract venture capital

RELEVANT SECTIONS OF PROPOSED LEGISLATION

- *Platform Competition and Opportunity Act of 2021 (H.R. 3826), Section 2 (a) (1, 2)*

Potential risks introduced: Constraining the ability for major tech platforms to acquire startups risks limiting investors' exit options and could disincentivize venture capital firms from funding U.S. tech startups and stifle innovation across the sector.

Potential economic competitiveness implications: Venture capital is integral to the U.S. tech sector and has contributed to the growth of many of the U.S.'s most successful tech companies over the past two decades.[32] After a steep decline in funding after 2000's dot com bubble, U.S. venture capital investment has been steadily increasing, from roughly 16 billion in investment in 2002 to 130 billion in 2020.[33] U.S.-based venture capital firms provided $88 billion to tech startups alone in 2020, and the tech sector attracted 78 percent of all U.S. venture capital funds, up from 74 percent in 2018. [34] In order for venture capital investors to make a return on their investment, they generally need firms to issue an initial public offering (IPO) or to be acquired by a larger firm.[35] Since the year 2000, the number of firms choosing to go public has dropped precipitously, declining by over 63 percent in the ensuing decades.[36] There are numerous factors contributing to the decline in IPOs, including expanded regulatory requirements[37] and higher costs,[38] but the end result has been an increased reliance of startup firms on acquisitions. Restrictions on large tech firms making new acquisitions—in ways proposed in Section 2 of the Platform Competition and Opportunity Act—could limit venture capitalists' willingness to invest in the U.S. tech sector. In an environment with relatively low and declining government investment, this could hamper the development of new startups.

Venture capital has been a major source of funding for emerging technology startups worldwide, and the destination of investments is shifting. At the start of the 21st century, the U.S. attracted 76 percent of all global venture capital funds,[39] while China accounted for less than 2 percent. Today, that figure stands at 47 percent while China is now the second-largest venture capital destination, accounting for 22 percent of global investment.[40] Faced with fewer options for acquisition in the U.S. market, alongside existing cost barriers for IPOs,[41] venture capital investors could continue moving investments to alternative markets. While China and Europe are currently the next largest venture capital destinations, there are ample emerging tech hubs that are increasingly attracting venture capital funds including Singapore, India, and Brazil.[42]

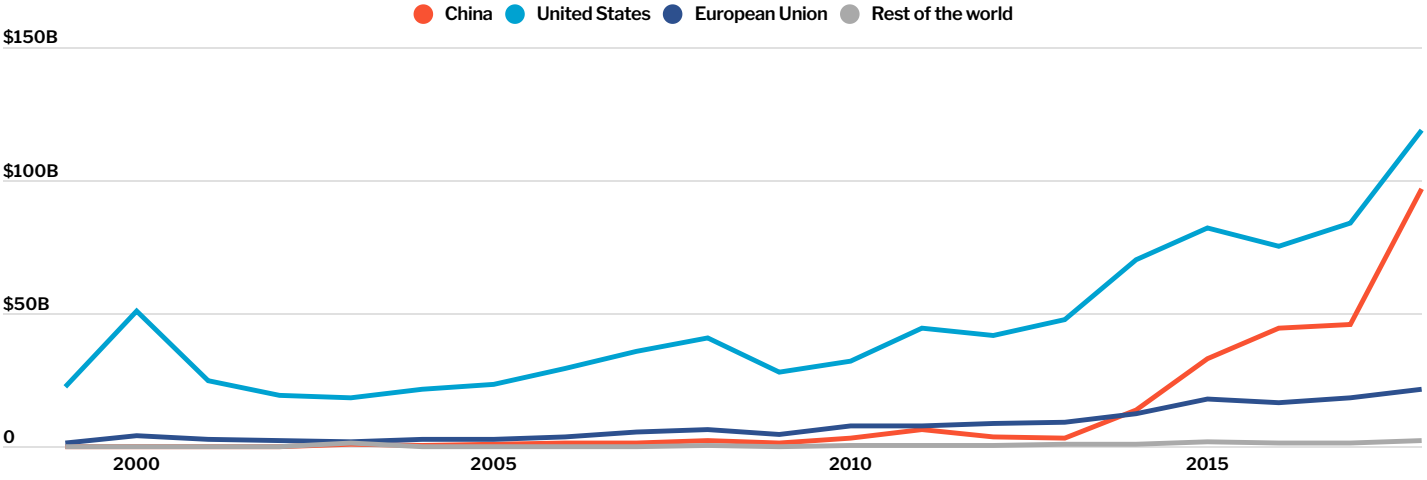
While the ability to attract venture capital has given U.S. companies a strong position in AI development, the global competition is fierce. Globally, AI startups attracted $77.5 billion in venture capital funding in 2021 alone.[43] The U.S. has been the largest destination for AI venture capital investment, attracting $23 billion in 2020, more than double China's $10 billion.[44] However, China has surpassed the U.S. in the commercial adoption of AI, possesses more sophisticated data collection operations,[45] and is home to hugely successful tech companies piloting AI innovation, such as ByteDance[46] (TikTok's parent company). Other major tech hubs, such as Japan[47] and Israel,[48] are also advancing rapidly in developing AI for use across multiple sectors, such as robotics and next-generation weapons. The restrictions on future acquisitions by major tech companies proposed in Section 2 of the Platform Competition and Opportunity Act could limit the attractiveness of the U.S. for venture capital funding. These factors, combined with the rise of attractive new markets, could adversely impact U.S. companies' competitiveness in emerging technologies with broad, cross-industry applications.

The same dynamics driving the global growth of AI startups apply to other technologies that are critical

to future economic growth and competitiveness. If the proposed tech regulation were to pass in its current form, under Section 2 of the Platform Competition and Opportunity Act, acquisitions by major U.S. tech firms would be considered unlawful by default unless the company could prove to the government that it would not harm competition. Similar restrictions would not be in place for large international firms, which could benefit from the decrease in competition. As currently written, provisions in the Platform Competition and Opportunity Act would also exclude major tech platforms from using their own capital to invest in startups. Major tech platforms occupy a central role in the U.S. startup ecosystem—from providing seed capital to acquiring firms—and proposed restrictions on them could potentially inhibit the emergence of new U.S. tech startups.

Global Venture Capital (VC) Investments

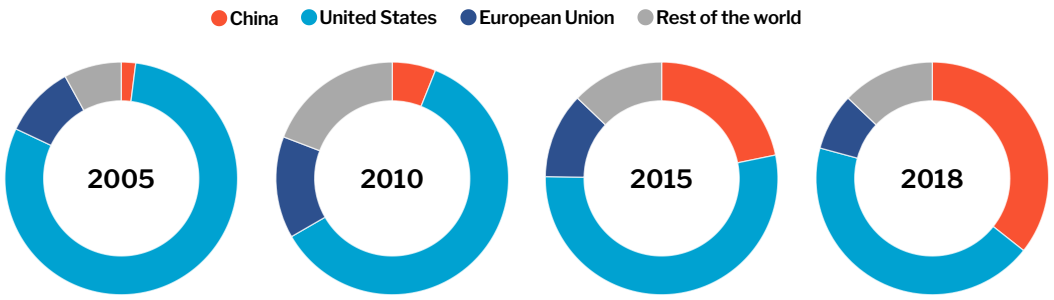
While the U.S. remains a global leader in VC investments, China is quickly catching up and is narrowing the gap in technology development.



Global Venture Capital (VC) Investment Share by Country

VC investments are growing rapidly, but the U.S.'s share of global investment is declining as China's grows.

SOURCE: NATIONAL SCIENCE FOUNDATION SCIENCE & ENGINEERING INDICATORS



ISSUE 3

Basing restrictions on company size and structure could limit the long-term ability of U.S. firms to compete against large international competitors

RELEVANT SECTIONS OF PROPOSED LEGISLATION

- *Platform Competition and Opportunity Act of 2021 (H.R. 3826), Section 3 (d)*
- *Ending Platform Monopolies Act (H.R. 3825), Section 5 (5), Section 2 (b) (1)*

Potential risks introduced: Major U.S. tech companies would be disincentivized to grow, due to the additional regulatory restrictions they would face at a certain market capitalization, and the largest tech companies would face barriers to business line diversification, while other large multinational companies could continue to compete internationally without similar restrictions.

Potential economic competitiveness implications: The current package of tech regulations being proposed in the U.S. Congress would place restrictions on companies based on the size of their user base and revenues. The combination of these restrictions would only apply to a select few U.S. tech companies and would exclude other large multinational companies and smaller U.S. companies. This could benefit some domestic competitors seeking to gain market share, but it would place major U.S. tech companies at a distinct disadvantage internationally. Many international competitors in emerging technologies are both larger and more diversified, but since they operate under business models that would not meet the threshold of having 50 million U.S.-based users, the proposed U.S. tech regulations would exclude them. In quantum computing, AI, and 5G technologies, international competitors such as Samsung, Huawei, and Sony are either larger than or nearly as large as the biggest U.S. firms operating in these industries (based on 2020 revenue).[49] These firms are also more diversified than U.S. firms and consistently file patents across a wider array of technologies than comparable U.S. firms.[50] In 5G technologies, large international competitors like Huawei and Ericsson hold dominant global positions,[51] and these same companies compete directly against major U.S. tech platforms in AI[52,53] and quantum computing[54] development.

Many of the large multinational firms that U.S. tech companies compete against already benefit from preferential treatment in their domestic markets. For instance, Samsung has received tax incentives, guaranteed loans, and subsidies from the South Korean government for over 50 years.[55] Similarly, the Chinese government has provided Huawei with over $75 billion[56] in support since 1996.[57] These major international tech competitors do not separate their product lines, which U.S. tech firms would be compelled to do under Section 2 of the Ending Platform Monopolies Act. For instance, the Chinese company ByteDance can use data it collects on TikTok to train the same AI that it uses in other lines of business, such as its news platform Toutiao.[58] It also uses data and technology developed through these platforms to sell other commercial products, including its cloud computing line and the underlying AI that powers TikTok.[59] While major U.S. tech firms are currently able to compete using these same types of integrated platforms, the designations for covered platforms laid out in Section 5 of the Ending Platform Monopolies Act could potentially prevent them from doing so. Altering the way major U.S. tech platforms operate, without similar restrictions on other large multinational tech companies, could make competing in data-reliant industries more difficult.

As currently drafted, the package of pending tech regulation could compound a number of emerging competitive barriers that major U.S. tech platforms already face internationally. In the EU, the Digital Services Act and the Digital Markets Act place restrictions primarily on U.S. tech platforms based on nearly the same criteria as the pending U.S. tech regulation. While aiming to boost the EU's domestic companies, these regulations would primarily limit major U.S. tech platforms while leaving most other large tech competitors untouched.[60] In China, the government has placed restrictions on foreign companies' operations and has preferenced its domestic firms since the early 2000s.[61] New initiatives, such as the National Informatization Strategy centered

on globalizing Chinese internet companies[62] and the Information Technology Application Working Committee[63] designed to favor domestic tech suppliers over foreign ones, are increasingly making operating in China untenable for many major U.S. tech platforms. India, another major emerging tech market, is also in the process of enacting rules that would limit U.S. tech platforms' competitive positions within its jurisdiction.[64] If the proposed U.S. tech regulations were to pass as currently drafted, major U.S. tech platforms would face unique regulatory barriers in the world's three largest tech markets.[65] This, in turn, could limit U.S. tech firms' ability to compete internationally against large multinational firms benefiting from government backing and favorable domestic legislation.

BY THE NUMBERS

By 2030, artificial intelligence (AI) could contribute up to **$15.7 trillion to the global economy**. China stands to capture the greatest economic gains of all regions, with AI **enhancing its GDP by 26.1 percent** ($7 trillion), followed by North America, whose GDP could grow by 14.5 percent ($3.7 trillion).[70]

Venture capital investment, which is heavily concentrated in the tech sector, is increasingly being dispersed amongst a range of countries. Singapore and Israel are the largest VC destinations in per capita terms,[71] while Latin America is the most rapidly growing region for VC inflows—growing **320 percent in 2021 to nearly $20 billion dollars**.[72]

South Korea and Japan spend the largest percentage of their GDP on R&D annually, at 4.1 and 3.4 percent, respectively, with the majority concentrated in the business sector. **The U.S. currently spends 2.7 percent of GDP on R&D**, while China spends 2 percent.[73]

Major technology companies are driving innovation in the U.S. by **spending twice as much on R&D than the U.S. Department of Defense** and over 18 times the amount of the National Science Foundation in 2020.[74,75]

LOOKING AHEAD

Ongoing discussion on balancing regulation and global tech innovation

Over the past three decades, the U.S.'s ability to lead in technological innovation has generated billions of dollars in economic benefits, created millions of new jobs, and broadly transformed the lives of users globally. Amid increasing competition globally and changing international market and policy dynamics, there is no guarantee that U.S. companies will be able to continue to sustain the same strong international position. The U.S. does not have "national champions" and does not back its technology sector through a comprehensive industrial policy, and competing against government-backed multinational companies in developing next-generation technologies poses a geo-economic and geo-strategic challenge. Major U.S. tech companies are facing increasing barriers to competition in the largest tech markets, as China, the EU, and India, among others, enact rules that protect and prioritize their own tech sectors. The development of next-generation technologies will have profound economic and security impacts in the U.S. market and around the world. In the future, AI will likely transform social media networks[66] and search functions while also revolutionizing the way weapons systems operate.[67] Likewise, quantum computing will enable faster download speeds[68] while rendering existing encryption techniques obsolete.[69] The transformative impacts of these technologies warrant strategic regulation and oversight to ensure that individual rights and civil liberties will be protected, without impeding growth and investment. Policymakers have the opportunity to craft regulations that help to ensure robust domestic competition and enable innovation amidst growing international competitiveness. The ability to effectively balance these concerns will have long term consequences that will reach far beyond the tech sector.

This analysis was produced by FP Analytics, the independent research division of Foreign Policy, and was supported by the Computer and Communications Industry Association (CCIA). CCIA did not contribute to any of the content, nor did it have any influence over any part of this analysis.

APPENDIX

PROVISIONS REFERENCED:

Ending Platform Monopolies Act (H.R. 3825)

- Section 2 (b) (1)

(b) Conflict Of Interest.—For purposes of this section, the term "conflict of interest" includes the conflict of interest that arises when—

(1) a covered platform operator owns or controls a line of business, other than the covered platform; and

- Section 2 (b) (2) (A, B)

(2) the covered platform's ownership or control of that line of business creates the incentive and ability for the covered platform to—

(A) advantage the covered platform operator's own products, services, or lines of business on the covered platform over those of a competing business or a business that constitutes nascent or potential competition to the covered platform operator; or

(B) exclude from, or disadvantage, the products, services, or lines of business on the covered platform of a competing business or a business that constitutes nascent or potential competition to the covered platform operator.

- Section 5 (5)

(5) COVERED PLATFORM.—The term "covered platform" means an online platform—

(A) that has been designated as a "covered platform" under section 6(a); or (B) that—

(i) at the time of the Commission's or the Department of Justice's designation under section 6(a), or any of the twelve months preceding that time, or in any of the 12 months preceding the filing of a complaint for an alleged violation of this Act—

(I) has at least 50,000,000 United States-based monthly active users on the online platform; or

(II) has at least 100,000 United States-based monthly active business users on the platform;

(ii) is owned or controlled by a person with net annual sales, or a market capitalization greater than $600,000,000,000 at, adjusted for inflation on the basis of the Consumer Price Index, the time of the Commission's or the Department of Justice's designation under section 6(a) or any of the two years preceding that time, or at any time in the 2 years preceding the filing of a complaint for an alleged violation of this Act; and

(iii) is a critical trading partner for the sale or provision of any product or service offered on or directly related to the online platform.

Platform Competition and Opportunity Act of 2021(H.R. 3826)

- Section 2 (a) (1, 2)

(a) Violation.—It shall be unlawful for a covered platform operator to acquire directly or indirectly—

(1) the whole or any part of the stock or other share capital of another person engaged in commerce or in any activity or affecting commerce; or

(2) the whole or any part of the assets of another person engaged in commerce or in any activity affecting commerce.

- Section 3 (d)

(d) Covered Platform.—The term "covered platform" means an online platform—

(1) that has been designated as a "covered platform" under section 4(a); or

(2) that—

(A) at the time of the Commission's or the Department of Justice's designation under section 2(d), or any of the twelve months preceding that time, or in any of the 12 months preceding the filing of a complaint for an alleged violation of this Act—

(i) has at least 50,000,000 United States-based monthly active users on the online platform; or

(ii) has at least 100,000 United States-based monthly active business users on the platform;

(B) is owned or controlled by a person with net annual sales, or a market capitalization greater than $600,000,000,000, adjusted for inflation on the basis of the Consumer Price Index, at the time of the Commission's or the Department of Justice's designation under section 4(a) or any of the two years preceding that time, or at any time in the 2 years preceding the filing of a complaint for an alleged violation of this Act; and

(C) is a critical trading partner for the sale or provision of any product or service offered on or directly related to the online platform.

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