



January 7, 2019

Ms. Kristen Mortimer
c/o Regulatory Policy Division
Bureau of Industry and Science
U.S. Department of Commerce
Room 2099B
1401 Constitution Ave, NW
Washington, DC 20230

Re: Comment on Advanced Notice of Proposed Rulemaking Regarding Review of Controls for Certain Emerging Technologies (Agency/Docket No. 180712626-8840-01).

Dear Ms. Mortimer,

Thank you for the opportunity to respond to the Advanced Notice of Proposed Rulemaking (ANPRM) on the review of export controls for certain “emerging and foundational technologies.” Engine is a policy organization representing American startups who are advancing technology every day. The next great products using artificial intelligence, machine learning, autonomous vehicles, drones, augmented reality, or advanced computing technology will undoubtedly be created by American startups. Therefore, the definition of “emerging technologies” that are essential to our national security is one that needs to be carefully crafted as to not hamper innovation. Additionally, we urge the Bureau of Industry and Security (BIS) to find a narrowly tailored solution, implemented in a transparent and multilateral manner, that specifically addresses national security concerns.

1. The American Startup Ecosystem and Export Controls

About Engine

Engine is a non-profit technology policy, research, and advocacy organization that bridges the gap between policymakers and startups. Engine works with government and a community of thousands of technology startups across the nation to support policymaking that promotes the development of entrepreneurship. The thriving U.S. startup ecosystem is responsible for some of the most innovative products and services as well as the majority of net job growth in the U.S. In order to create an environment for technological innovation to flourish, Engine works with lawmakers to create policies that decrease regulatory burdens that threaten American startups.

The Economic Importance of Startups

While there is no universally accepted definition of a “startup” company, startups share some generally recognized characteristics that are important to consider when looking at proposed regulations. First, startups are companies in their early stages of operations, searching for a repeatable and scalable business model that can achieve growth unconstrained by geography. Second, generally recognized

metrics for startups include being in operation for less than five years, having less than 100 employees, and having less than \$100 million in annual revenue. And finally, startups are designed to scale very quickly, and can change business models multiple times.¹ All of these factors allow startups the flexibility and potential to become large businesses, but without clear guidelines and access to global markets, many startups will fail before they can reach their full potential.

Technology startups are a vital and growing part of the American economy and the U.S. should take measures to ensure that technology companies continue to develop here. In 2015, the technology industry provided roughly 6.7 million jobs in the U.S., a total workforce that exceeds many other important sectors such as construction, finance and insurance, motor vehicle manufacturing, and food manufacturing.² Technology sector jobs have grown consistently since the Great Recession, with five straight years of growth from 2009 through 2015.³ Notably, at a time when wage stagnation is so prevalent in the U.S., technology sector jobs pay significantly higher wages compared with average private sector wages: average annualized wages for the U.S. technology industry were \$105,400 in 2015, more than double the average wage for all other private industries that year.⁴ Technology jobs also have a ripple effect across the economy. According to research, the creation of one high tech job is projected to create 4.3 other jobs in a local economy.⁵ Overall, tech sector jobs lead to much greater job creation in the wider economy than other sectors and are vital for the success of America.

The key difference between a startup and a traditional small and medium-sized enterprise (SME) is the potential to grow exponentially. Traditional SMEs rarely seek to build a business beyond an existing customer or geographic base, and even fewer set out to disrupt entire industries. But for startups, growth is not limited by national boundaries and most aspire to build global solutions and design world-changing innovations. To do that, startups need to rapidly scale their businesses in areas of technology that are not yet fully developed and rarely constrained by geography. Therefore, exports are a key component to future growth.

Why Startups Care about Export Controls

The U.S. is the world's preeminent hub for technology startups in part because American startups have been incredibly successful at rapidly penetrating international markets at early growth stages. Moreover, startups are almost always in export-based industries, which helps America's competitiveness.⁶ According to 2017 U.S. Bureau of Economic Analysis data, technology-based industries exported \$600 billion in goods and services and generated \$2 trillion in gross output.⁷ There are several contributing factors to the

¹ Cary Ingram, "Global Ignition - A Strategic Primer on Accelerating Startups to International Markets," International Trade Administration, (December, 2015), <https://www.trade.gov/industry/assets/Global%20Ignition%20-%20A%20Strategic%20Primer%20on%20Accelerating%20Startups%20to%20International%20Markets.pdf>.

² CompTIA, "Cyberstates 2016, The Definitive State-by-State Analysis of the U.S. Tech Industry," (2016), <https://www.comptia.org/docs/default-source/advocacydocs/cyberstates/comptia-cyberstates-2016-vfinal-v2.pdf?sfvrsn=2>.

³ Id.

⁴ Id.

⁵ Engine Advocacy and Bay Area Council Economic Institute, "Technology Works: High-Tech Employment and Wages in the United States," (December 2012), <http://documents.bayareacouncil.org/TechReport.pdf>.

⁶ J. John Wu and Rob Atkinson, Information Technology & Information Foundation, "How Technology-Based Startups Support U.S. Economic Growth," (November 2017), http://www2.itif.org/2017-technology-based-start-ups.pdf?_ga=2.163273404.1257241588.1546851607-1982172408.1545083629.

⁷ U.S. Bureau of Economic Analysis, Industry Data (Gross Output, accessed October 15, 2017), https://www.bea.gov/iTable/index_industry_gdplndy.cfm.

exporting success of American technology startups, including low barriers to entry, ease of technology adoption across cultures, zero-to-low tariffs on most product categories, and minimum regulatory requirements.

However, starting a company is always an extremely risky proposition and almost half of all startups fail within their first five years.⁸ The reasons for failure are as unique as the startup itself, but there are a few factors the government should consider. First, for many startups there is hesitation to engage with the federal government as it is often viewed as a barrier to the business goals of fast-growing companies. Second, startups are incredibly sensitive to increased bureaucracy since additional regulatory barriers can derail growth, decrease investment, and force companies to invest in lawyers, rather than business development. Finally, export controls and other regulations often lag a step or two behind the times which means many startups in cutting-edge technical fields have not been subject to export controls and could freely export without significant restrictions. Therefore, any new export controls need to be carefully considered and narrowly tailored as to not harm America's startups.

2. The Potential Impact on Startups by the ANPRM

Technological innovation typically moves at a much quicker pace than policymaking. Therefore, it is important for the government to react to new innovations with a full understanding of the technologies at issue and the consequences of the proposed regulations. Since the passage of the Export Control Reform Act of 2018 (ECRA) startups have been worried about increased regulatory barriers for developing new technologies. Most of this anxiety comes from the uncertainty surrounding regulatory outcomes and an ignorance of the export control system. For many American startups, as long as they were not designing a product for a military application, and no encryption or cryptographic technology was involved, new ideas developed in the U.S. were simply unaccounted for under Export Administration Regulations (EAR). However, with the passage of ECRA, and particularly Section 1758, BIS has the ability to fundamentally alter several industries where startups are thriving.

We understand the importance of export controls to promote our national security interests, but want to help BIS find a way to balance the needs of innovators and startups as well. We will first look at how “emerging technologies” should be defined and then the factors BIS should consider when implementing controls.

A. Defining “Emerging Technologies”

Under ECRA, “emerging and foundational technologies” are those *essential* to the national security of the U.S. and are not now described on one of the lists of technologies the U.S. controls for export. Understanding that many startups are working on developing technologies that could have dual-use purposes with national security implications, it is important to examine what “national security” means and then examine what is “emerging,” particularly in relation to artificial intelligence and machine learning.

i. National Security Implications

“National security” in the ANPRM is defined as technologies that are “potential conventional weapons, intelligence collection, weapons of mass destruction, or terrorist applications, or could provide the United States with a qualitative military or intelligence advantage.” This list is further limited by ECRA section 1752(1) which states that the United States should “use export controls only after full consideration of the

⁸ U.S. Small Business Administration Office of Advocacy, “Frequently Asked Questions About Small Business.” (August 2017), <https://www.sba.gov/sites/default/files/advocacy/SB-FAQ-2017-WEB.pdf>.

impact on the economy of the United States and only to the extent necessary (A) to restrict the export of items which would make a significant contribution to the military potential of any other country or combination of countries which would prove detrimental to the national security of the United States; and (B) to restrict the export of items if necessary to further significantly the foreign policy of the United States or to fulfill its declared international obligations.” Section 1752(3) further states that “the national security of the United States requires that the United States maintain its leadership in the science, technology, engineering, and manufacturing sectors... Such leadership requires that United States persons are competitive in global markets.”

Section 1752(3) aligns closely with the Administration’s National Security Strategy (NSS) which states that to protect our national security, the government must enact policies that promote growth and innovation.⁹ NSS states that a “strong economy protects the American people, supports our way of life, and sustains American power. American workers thrive when they are free to innovate... [and] operate in markets free from excessive regulation and unfair foreign trade practices.” Therefore, it is important to consider the impact export regulations could have on global competitiveness. To sustain market dominance in technological advancement, any definition must protect the freedom for startups to innovate. Economic security is an essential component of national security.

Any “emerging technology” definition must limit the export controls to technology that is required for “development, production, use, operation, installation, maintenance, repair, overhaul, or refurbishing of specific and identifiable potential convention weapons, intelligence collection applications, weapons of mass destruction, or terrorist applications.” While we need to protect our national security, the regulated technology must be providing the U.S. a specific and identifiable military or intelligence advantage. If dual-use technologies are over-regulated there will be significant impact on the development of commercial uses of many of these products.

ii. Emerging Technologies

By their very nature, startups are in the business of creating emerging technologies. In order to promote innovation, any definition of “emerging” must be explicit and narrowly tailored. If the scope of the controls is too broad or vague, the regulations will stifle growth, drive up costs, impede research, and motivate domestic businesses to move overseas. There are three factors to consider when looking at crafting a definition of “emerging technologies.”

First, technologies should not be defined as an “emerging” if they are available, or otherwise being developed, in foreign countries. If competitors or end-users are able to procure an item in another country, export controls will be ineffective when trying to limit the proliferation of emerging technologies to foreign countries.

Second, BIS should not regulate technologies that are already within the scope of existing multilateral controls. Multilateral controls are a far more effective way to protect our national security than a unilateral export control. Emerging technologies should only be subject to export controls if it is likely that they will be considered acceptable and consistent with the standards of multilateral regimes.

Third, in deciding whether to identify a technology as “emerging” and imposing controls on exports, ECRA section 1758(a)2(B) requires the Administration take into account the effect export controls imposed may

⁹ The White House, “National Security Strategy of the United States of America,” (December 2017), <https://www.whitehouse.gov/wp-content/uploads/2017/12/NSS-Final-12-18-2017-0905.pdf>

have on the development of technologies in the U.S. Technology should not be identified as “emerging” if the export controls would harm domestic research and investment into the identified technology. BIS should not impose any regulation without fully considering the impact on the U.S. economy and potential high-growth industries.

iii. Artificial Intelligence and Machine Learning (AI/ML)

The most troublesome piece of the ANPRM for startups was the inclusion of AI/ML in the list of “representative technology categories.” Unfortunately, the U.S. government still lacks a commonly agreed upon definition for the technology in a regulatory environment even though academics and researchers have been exploring AI/ML for decades.¹⁰ However, startups are not waiting for a definition from the government. Recent advances in computing power, Internet connectivity, cloud computing, and access to data have made AI/ML a part of our everyday lives, delivering benefits to consumers and businesses through applications and techniques like smartphone speech recognition, e-commerce recommendations, and spam filtering. Additionally, entire industries are adapting AI/ML in areas including precision agriculture, health care, energy consumption, cybersecurity, and financial fraud prevention.

Given this broad scope of potential applications, it should be no surprise that AI/ML investment is at an all-time high and continues to rise as the technology matures.¹¹ Despite fears that China will outpace the U.S. in AI, the vast majority of AI startups globally are based in the U.S. with more than 650 venture-backed U.S. companies developing AI systems.¹² Policymakers should keep this tremendous potential in mind when approaching AI/ML. Without narrowly tailoring the definition of emerging technologies, it’s difficult to imagine how an export control regime would limit AI/ML exports without significantly reducing all U.S. exports, competitive advantage, and innovation.

B. How Should BIS Control the Export of Dual-Use Technologies to Protect Startups

The success of U.S. startups depends on access to global markets, leveraging a globalized supply chain, low regulatory burdens, and reliance on talent from around the world. For American startups to continue to grow their businesses and create jobs, the implementation of export controls needs to be narrowly tailored to focus on core technology, transparently applied, multilateral, and limited to national security concerns.

i. Narrowly Tailored to Focus on Core Technology

In order to scale a startup, the company must be able to clearly operate within the boundaries of the law. Studies show that investors are less likely to fund companies where regulations are inconsistent or ill-defined.¹³ To increase innovation, the scope of the controls must be narrowly tailored to specific, clearly identifiable national security threats. Broad or vague controls will stifle growth, drive up costs, impede research, and motivate domestic businesses to move technology development overseas. To better assist startups, BIS needs to provide a list of the emerging technologies it wishes to control and the specific

¹⁰ The definition of artificial intelligence found in S. 2217 - “The FUTURE of Artificial Intelligence Act of 2017” provides the Department of Commerce a widely accepted definition of AI that would be helpful to any efforts to define AI/ML in the export controls context.

¹¹ The average early-stage round for an AI or machine learning startup in 2010 was about \$4.8 million. In 2017, that ballooned to \$11.7 million. Jason D. Rowley, “Venture Funding AI and Machine Learning Levels Off as Tech Matures.” Crunchbase, March 2, 2018.

<https://news.crunchbase.com/news/venture-funding-ai-machine-learning-levels-off-tech-matures/>

¹² “Artificial Intelligence Index, 2017 Annual Report.” (November 2017). <http://aiindex.org/2017-report.pdf>

¹³ Evan Engstrom, Matthew Le Merle, and Tallulah Le Merle, “The Impact of Internet Regulation on Early Stage Investment,” Fifth Era and Engine Advocacy, (November 2014), at 5.
<http://www.fifthera.com/perspectives-blog/2015/3/20/6enku92k815grtyz9vfpmn83lqhfsc>.

uses of the dual-use technologies. For example, a wide range of startups use “speech and audio processing” technologies, but the vast majority are not doing so in a way that would harm national security interests. Providing concrete examples can help clear up any confusion.

ii. Transparency

Startups frequently avoid working with the government for fear of being caught in red-tape that could slow down product launches and entangle a small team with a mountain of legal work. In our work with startups, however, we have found that increased transparency upfront could solve the majority of issues. We understand that for national security reasons BIS cannot be as transparent as in other areas, but we ask that any new controls be implemented with as much industry feedback as possible to avoid confusion. If not, the regulations will likely deter investors and foreign business partners. Finally, any proposed control lists should be regularly reviewed, revised, and updated with an opportunity for startups to weigh in when appropriate.

iii. Increased Compliance Costs

The controls listed in the ANPRM will likely increase the number of license applications and other paperwork that startups must submit to BIS and other agency officials. If enacted, BIS needs to ensure there are resources available to startups to decrease burdens or delays caused by increased regulations. In a globally competitive world, waiting on bureaucratic decisions can significantly impede a startup’s ability to enter new markets and find investment.

iii. Need Multilateral, Not Unilateral Controls

Export controls imposed unilaterally, especially on items widely available from foreign sources, are ineffective to prevent end-users from acquiring those items. Therefore, unilateral enforcement runs a serious risk of making American startups less competitive internationally. Any export controls imposed by BIS should be coordinated with multilateral export control regimes to be effective.

iv. Limited to National Security Concerns, Not Trade Policy

Export controls are blunt instruments and should be limited to reducing the proliferation of certain technology specifically for national security concerns. If additional export controls are seen as a tool to influence trade policy or increase trade protectionism, startups could be negatively impacted globally. There are numerous other tools the government has at its disposal to address trade policy challenges such as sanctions, trade remedies, foreign direct investment controls, intellectual property theft remedies, and counter-espionage laws.

Conclusion

Thank you again for the opportunity to comment on this process for defining emerging technologies that are essential to our national security. The American startup ecosystem is a global powerhouse for technological development and export controls must be limited to protect this key economic sector. We hope to continue to work with BIS on this important topic.