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Regulatory Policy Division
Bureau of Industry and Security (BIS)
U.S. Department of Commerce, Room 2099B
14th Street and Pennsylvania Avenue, NW
Washington, DC 20230

Re: Advance Notice of Proposed Rulemaking (ANPRM) on Review of Controls for Certain Emerging Technologies, FR 2018-25221, Published November 19, 2018
Docket No. 180712626-8840-01, Docket No. BIS-2018-0024-0001

Dear BIS Regulatory Policy Division:

The National Venture Capital Association (NVCA) represents a diverse membership base of venture capital firms and corporate venture capital groups spread across the country, investing in sectors as varied as medical devices, information technology, and cybersecurity. The above-referenced ANPRM may have profound impacts on many of the sectors in which NVCA members invest, as well as on those members' future ability to invest in those sectors at all. Accordingly, NVCA appreciates this opportunity to submit comments regarding the ANPRM.

Venture capitalists invest in and partner with high-growth startups with transformative ideas that power innovation and our economy. As the voice of the U.S. venture capital community, NVCA empowers its members by advocating for policies that encourage innovation and reward long-term investment. NVCA also serves as the definitive resource for venture capital data and unites its member firms through a full range of professional services.

The model of venture firms is to raise capital from investors (*i.e.* limited partners) to invest in early stage companies. Some of these limited partners are from abroad, as foreign investors seek returns in the same manner as U.S. investors. Corporate venture groups also invest significantly in early-stage companies and some of these are headquartered overseas. These investments fuel U.S. entrepreneurship, jobs, technological leadership, and ultimately national security.

NVCA and its member firms believe that an overbroad definition of “emerging technologies” could immediately and directly impede American innovation across many developing areas of technology by cutting off access to talent and cross-border collaboration. Perhaps even more dangerously, such a definition could indirectly but significantly impair the access to capital necessary to sustain innovation in many of these developing fields, given the relationship between emerging technologies and the recently passed Foreign Investment Risk Review Modernization Act of 2018 (FIRRMA).

In particular, NVCA hopes to emphasize three key points in these comments. First, the venture capital community is the single largest driver of emerging U.S. company innovation and draws on capital and talent from across the world. An overbroad definition of emerging technologies, and thus an overbroad application of FIRRMA, may have devastating consequences for the innovation economy. Second, many of the representative general categories of technologies listed in the ANPRM are not yet well-defined. Because technologies that could be deemed to fall into those categories are widely used across many emerging technology companies, a broad set of controls could sweep in many unintended target companies and technologies. Third, the case for investing in many U.S. emerging technology companies relies, in many circumstances, on their ability to find talent and worldwide commercial markets for their innovative products. To the extent that the new rules prevent U.S. companies from accessing that talent and those markets, global venture capital may well redirect to innovators in other nations.

The above concerns can be mitigated by utilizing a targeted approach to the classification of emerging technologies. By categorizing only those technologies that have significant defense uses – and not those that merely have broad commercial implications or incidental national security significance – BIS can ensure that the impact on American scientific and technological advancement is minimized while still protecting important security interests

NVCA and its members appreciate the critical role BIS plays in ensuring that sensitive dual-use technologies are not inappropriately accessed by strategic competitors. NVCA also believes that Congress has rightly suggested that control of certain emerging technologies should be a key part of BIS’s mission going forward. In these comments, NVCA requests that BIS carefully consider which technologies are truly sensitive from a national security perspective.

I. Venture Capital’s Role in the Innovation Economy is Critical, and Designating a Broad Set of Emerging Technologies Could Hamper VCs Ability to Invest in U.S. Companies

A. U.S. Venture Investment is Critical to High-Technology Entrepreneurship

The U.S. venture capital community is the world’s largest and most developed. According to the 2018 NVCA Yearbook, global venture capital investment surged from \$46 billion in 2010 to

\$158 billion in 2017 – an increase of 240 percent – and companies in the U.S. received just over half of those 2017 funds.¹ These funds supported more than 8,000 companies in various fields of high-tech entrepreneurship ranging from biotechnology to information services to materials science.

NVCA is the leading organization representing the interests of the investors who make that high-tech entrepreneurship possible. Venture capitalists invested nearly \$85 billion in U.S.-based companies in 2017 and have invested more than \$350 billion over the last five years. Venture capitalists in NVCA’s membership include those who manage closed-end funds that raise committed capital from a variety of investors, both foreign and domestic. In addition, NVCA includes the venture investing arms of many major foreign and domestic corporations that operate across a range of industries. An increasingly large number of corporations also (or solely) invest in startups to further next-generation research and development and earn returns.

According to a 2015 Stanford University study, 42 percent of all U.S. company initial public offerings (IPOs) since 1974 were venture-backed.² Collectively, those venture-backed companies have invested \$115 billion in research and development (R&D), and created \$4.3 trillion dollars in market capitalization, accounting for 85 percent of *all* R&D spending and 63 percent of the total market capitalization of public companies formed since 1974. Specific to the impact on the American workforce, a 2010 study from the Kauffman Foundation found that young startups, many of them venture-backed, were responsible for almost all the 25 million net jobs created since 1977.³

Venture capital plays a central role in promoting novel technologies. PitchBook⁴ tracks venture investment across a number of different technology sectors named in the ANPRM; one thing almost all of those sectors have in common is steadily increasing venture deal flow over the last ten years.⁵ For example, from 2008 to 2018, venture investment in U.S. artificial intelligence/machine learning startups rose from \$400 million to \$13.8 billion.⁶ Over that same period, venture investment in U.S. advanced manufacturing/3D printing businesses climbed from

¹ National Venture Capital Association, 2018 NVCA YEARBOOK (March 2018), *available at* <https://nvca.org/download/71505/> (“NVCA YEARBOOK”).

² Will Gornall and Ilya A. Strebulaev, *The Economic Impact of Venture Capital: Evidence from Public Companies*, Stanford University Graduate School of Business Research Paper No. 15-55 (*last revision* December 2015), *available at* https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2681841.

³ Tim Kane, KAUFFMAN FOUNDATION RESEARCH SERIES: FIRM FOUNDATION AND ECONOMIC GROWTH - THE IMPORTANCE OF STARTUPS IN JOB CREATION AND JOB DESTRUCTION (July 2010), *available at* https://www.kauffman.org/~media/kauffman_org/research%20reports%20and%20covers/2010/07/firm_formation_importance_of_startups.pdf.

⁴ PitchBook is the official data provider of NVCA and widely considered to be the industry standard for venture capital data.

⁵ Provided to NVCA by PitchBook. Data as of December 3, 2018.

⁶ *Id.*

\$73 million to \$1.6 billion.⁷ It is no accident that the maturation of the underlying technologies in these sectors has coincided with rapid growth in venture investment in those same sectors.

The ability to draw upon non-U.S. capital and talent is a key component of this model of innovation. NVCA member firms leverage worldwide expertise, with many firms' general partnerships including members from countries as diverse as Canada, Greece, Israel, India, and South Korea. In addition, those member firms attract capital investment from parties all over the world eager to participate in the U.S. startup market. Foreign investors also regularly co-invest alongside American venture capital firms. According to Pitchbook, in 2017 foreign investors participated in 1,615 U.S. venture deals that raised \$38.9 billion in capital.⁸ The vast majority of these investors were not from strategic competitor nations – 1,410 of those transactions involving \$35.7 billion in capital featured no Chinese or Russian involvement.⁹ Foreign investment is also more specifically critical to the technology sectors named in the ANPRM – in biotechnology, for example, 111 transactions in 2017 involved foreign investors, raising \$5.1 billion in capital.¹⁰

All of this capital is necessary because venture investors deploy capital into transformative companies and foreign capital plays a critical part in fueling that innovation. Foreign investors generally receive a return on their investment, but the United States receives the better end of the bargain as this capital is used to create American jobs, scientific and technological leadership, and intellectual property. Put another way, the investment risk is distributed globally and nearly all the benefit is focused in the United States.

B. A Broad Definition of “Emerging Technologies” Could Disrupt this Innovation Architecture

If BIS elects to control a large set of technologies as emerging technologies, the venture capital ecosystem could be significantly damaged. This is primarily the case because FIRRMA extends the jurisdiction of the Committee on Foreign Investment in the United States (CFIUS) to reach a significant percentage of direct and indirect investments into “critical technology” companies, including those that work with emerging technologies. Because many venture firms rely on foreign persons and foreign capital, a broad reclassification of technologies could in turn broadly impede investment into the very companies that will drive the next generation of these novel technologies.

The new CFIUS pilot program initiated under FIRRMA mandates filings for any foreign investment into a critical technology company (though the requirement is temporarily restricted to companies active in certain industries), in cases where that investment (i) grants the investor “control” (broadly defined under the CFIUS regulations); (ii) provides the investor board rights, including observer or nomination rights; (iii) permits the investor access to material nonpublic technical information; or (iv) allows the investor a substantive decision-making role with respect to the disposition of technologies.

⁷ *Id.*

⁸ *Id.*

⁹ *Id.*

¹⁰ *Id.*

A significant majority of the investments made by NVCA members satisfy one of these criteria, as one or more of these rights are often necessary to monitor and manage investments effectively. In addition, as noted above, many venture firms have non-U.S. general partners or have raised foreign capital, either of which could lead that U.S.-based venture firm to be considered a foreign person under the existing CFIUS regulations. Accordingly, for many investments, whether or not the company deals in critical technologies is a deciding factor in determining whether the investment must be filed with CFIUS.

Venture investments commonly are researched, proposed, negotiated, and closed in a matter of weeks. However, CFIUS rules for these mandatory filings require parties to obtain clearance by CFIUS at least 45 days prior to making investments in emerging technology companies, which does not include the days – or more commonly weeks – that it takes to research and prepare the declaration before it is filed with CFIUS. Both the 45-day delay and the added cost and uncertainty associated with the application will slow the investment process and ultimately harm the U.S. company that needs capital to grow and prosper. This delay is particularly harmful to venture-backed startups. Because the founders of these enterprises are selling a piece of the company when they raise capital from venture investors, they generally raise only as much capital as is strictly necessary and do so as close in time as possible to when that capital is needed.

In cases where reclassification of a subject company's technologies may create a mandatory CFIUS filing requirement, venture investors will become more cautious and reduce the number of investments that they make into those U.S. businesses. Indeed, this is already the experience of many NVCA members. NVCA has learned of investors in countries such as Switzerland, South Africa, and Germany that have paused investments in U.S. startups as a direct result of the FIRREA pilot program. These reductions in investment will add up quickly, and if the emerging technology definition is not appropriately tailored, we should expect these investment disruptions to increase substantially.

BIS should encourage venture investors to be bold. The American economy relies upon high-risk, early-stage investments by venture capitalists to fuel technological and scientific advancement. No other asset class or any government entity is willing to take on the same level of risk as venture capitalists, given the incredibly high failure rate of high-growth startups and the long-term horizon for a successful company to materialize. According to one 2012 study, 30-40% of startups end up liquidating all assets, with investors losing all their money. Even more tellingly, 95% of startups fail to provide the projected return on investment.¹¹ Furthermore, the median time from the first VC financing to IPO is more than 7 years, with areas such as healthcare extending out much further.

¹¹ Deborah Gage, *The Venture Capital Secret: 3 Out of 4 Start-Ups Fail*, THE WALL STREET JOURNAL, Sept. 20, 2012, available at <https://www.wsj.com/articles/SB10000872396390443720204578004980476429190>.

II. Horizontal Technologies Included Among the ANPRM Representative Categories are Particularly Inappropriate as Potential Subjects of Export Controls

One important characteristic of many of the emerging technologies listed in the ANPRM is that their most productive uses are not yet well understood. Because of their promise and because of this lack of established utility, such technologies may initially be used across a wide variety of fields. Some will prove useful in many situations. These “horizontal technologies” – novel technologies with many potential applications – are particularly inappropriate as the subject of export controls. The breadth of their utilization means that any rule subjecting them to control would bring a wide variety of innovators in fields without any national security significance under BIS’s purview. Requiring fast-moving startup companies to seek permission to obtain investment or share knowledge across such a wide array of industries is not a recipe for continued U.S leadership in emerging technologies.

A number of technologies listed among the representative categories subject to prospective control should be considered horizontal technologies of this kind. For example, artificial intelligence (AI) and machine learning (ML) technologies are broadly used in an array of applications ranging from modeling the effectiveness of certain drugs to defending networks to targeting advertising. Similarly, gene editing technologies such as CRISPR tools are used everywhere from drug testing to designing replacement organs to developing new therapeutics. BIS should recognize that many technologies (to include, but not limited to, AI/ML, robotics, and CRISPR) may be used to power products and services across many sectors, and when used in such a way usually do not pose the same security threats as fundamental research into those areas might.

BIS has experience with another horizontal technology with wide-ranging uses across many industries – *i.e.*, encryption. As with encryption, establishing practical controls over many of these other horizontal technologies would require broad exceptions and regular updates and clarifications. Because uses for these technologies are by definition still emerging, it would be even more impractical to attempt to control them broadly than it has been to control the use of encryption.

In addition, for all the reasons described in the previous section, controlling horizontal technologies could stymie investment into a wide range of U.S. businesses. The categories listed in the ANPRM have no clear meaning and no clear boundaries and it is incredibly uncertain whether these issues will be resolved in the foreseeable future. If BIS were to classify emerging technologies in categories as broad as “machine learning” or “genetic engineering,” it would inevitably lead to entities that have nothing to do with national security issues – advertisers, drugmakers, and more – becoming subject to BIS control and CFIUS review. Overbreadth of this variety would stymie U.S. innovators when they should be encouraged.

III. Regulatory Obstacles to Innovation May Lead to the Displacement of Investment

Subjecting a wide range of technologies to control as emerging technologies also may directly impact the desirability of the U.S. as a location for global venture investment. America's primary attractions to innovators include its unparalleled talent pool, much of which is drawn from all over the world, and its business regulatory environment, which is both open and predictable. If businesses working on the cutting edge of technology become subject to control as emerging technology companies, they may lose the ability to leverage both of these advantages.

First, many American companies that work with advanced technologies rely on a workforce that contains many foreign personnel. In many cases those non-U.S. persons have entered the United States on visas specifically designed to attract their skills to assist in the development of American technology. If the underlying technologies are controlled as emerging technologies, employing such personnel would presumably be considered a deemed export. Obtaining licenses when hiring such personnel would present a tremendous burden for small, high-growth startups that often build teams by attracting the best and brightest from foreign countries.

Second, companies in the U.S. often draw investment with business plans that involve taking a useful new commercial technology to global markets. In many cases, the prospect of a global market is what makes a given company viable. For example, a business that is developing a treatment for an illness that only affects one in every hundred thousand people needs to know that its therapies can be manufactured overseas and thereby may have a prospective market of more than the 3,000 or so potential U.S. customers. Venture investors have relied on the ability of U.S. companies to serve as a base of operations for commerce around the world. However, export controls on emerging technologies could complicate cross-border technology exchange, including commercial licensing and sales of products and services, making U.S.-origin technologies harder to rely upon in building a global base of operations.

Because the United States has encouraged long-term investment in startups, the U.S. is the global innovation hub (as discussed above). However, this leadership is not a foregone conclusion and an overly restrictive emerging technologies definition could inhibit investment in the U.S. and push this capital overseas—a perverse outcome given the goals of policymakers.

To the extent that the baseline advantages discussed above are no longer available, venture investors may seek alternative markets. The same 2018 NVCA Yearbook and a recent study by the Center for American Entrepreneurship reported that while the U.S. still receives the majority of venture capital deal flow and venture dollars invested globally, its share of that investment has decreased drastically over time.¹² In the mid-1990s, U.S. companies received more than 95 percent of all global venture dollars invested; today, they receive only a little more than half.¹³

¹² NVCA YEARBOOK and Richard Florida and Ian Hathaway, RISE OF THE GLOBAL STARTUP CITY: THE NEW MAP OF ENTREPRENEURSHIP AND VENTURE CAPITAL (October 2018), available at <http://startupsusa.org/global-startup-cities/report.pdf> (“GLOBAL STARTUP REPORT”).

¹³ GLOBAL STARTUP REPORT.

Over that same timeframe, for example, China has gone from effectively no venture capital-backed companies to being responsible for nearly a quarter of global venture capital investment.¹⁴ In 2006, the United States was home to ten of the ten largest venture deals in the world; whereas last year China was home to seven of the ten largest venture deals. This trend could be exacerbated with an expansive emerging technologies definition.

In other words, global investors have options today that they did not have even ten years ago. American companies compete on their capacity to attract the best minds and create global businesses. Placing regulatory burdens on emerging technologies may challenge their ability to do so going forward, and accordingly may make it less likely that the U.S. leads the way in continuing technological innovation.

IV. The Solution to All of These Concerns is for BIS to Define a Narrow Set of Emerging Technologies

NVCA reiterates its belief that the concerns that BIS is addressing in this proceeding are important and the venture capital community believes that some controls on emerging technologies are patently warranted. However, the concerns described above are also important, not only for venture capital investors or U.S. entrepreneurs, but also for American national security. In order to remain a technology leader, the U.S. needs a robust innovation ecosystem.

NVCA believes the same solution can address all three of the concerns it raises above – namely, taking a targeted approach to the classification of emerging technologies. By categorizing only those technologies that have significant defense uses – and not those that merely have broad commercial implications or incidental national security significance – BIS can ensure that the impact on innovation is minimized while still protecting American security interests. To do otherwise would court the dangers described above, potentially impeding global collaboration and commercialization of U.S. technologies and impairing the attractiveness of U.S. businesses to investors. That impairment, ironically, would be to the ultimate detriment of American national security.

¹⁴ *Id.*