Statement before the
Subcommittee on Monetary Policy and Trade
House Financial Services Committee

Testimony by:

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Thank you, Chairman Barr, Ranking Member Moore and Members of the Committee,

I'm pleased to be with you today to share findings of work I've led for the Defense Department in understanding the role that Chinese investments in early-stage technology firms have in China's systematic plan to transfer technology. Because of this work, I am a strong proponent of the proposed FIRRMA (Foreign Investment Risk Review Modernization Act) legislation.

I came to this work as a former CEO of two Silicon Valley companies: Quantum, a computer storage provider where I worked for 20 years and Symantec, the cybersecurity firm where I was CEO through the fall of 2016. In my career, I've also worked as an investor, board member and chairman of several early-stage companies in Silicon Valley and in the Boston area. I'm here today in my personal capacity as a Presidential Innovation Fellow and not as a spokesperson for the Defense Department.

In the fall of 2016, at the request of then Defense Secretary Ash Carter and Vice Chairman of the Joint Chiefs, General Paul Selva, I began researching along with Pavneet Singh *whether* and *how* China is transferring technology through investments in early-stage firms. Last year, the Defense Innovation Unit Experimental (DIUx) produced an unclassified report with our findings that we've shared widely within the U.S. government entitled *China's Technology Transfer Strategy: How Chinese Investments in Emerging Technology Enable a Strategic Competitor to Access the Crown Jewels of U.S. Innovation*. In summary, what we learned was that China's participation in venture deal financing was at a record level of *16% of* ***all*** venture deals financed in 2015 and remained at 10% in 2016 and 11% in the first ten months of 2017. This is concerning for several reasons.

<u>Concerns with Chinese Investment in Early-Stage Companies</u>

First, the *growth* of these investments is up substantially from a level of 1-6% from 2010-2014. We identified more than 500 Chinese-based or affiliated entities investing in U.S. early stage companies in 2017.

Second, the technologies where Chinese firms are investing are the *same* as where U.S. venture capital firms are investing and will be foundational to future innovation such as artificial intelligence, autonomous vehicles, augmented/virtual reality, robotics, blockchain and genetic engineering. Moreover, since these technologies are dual-use--designed for commercial use but also equally important for military applications--these technologies will continue to be critical in advancing U.S. military capability.

Third, since venture investing depends on deal flow, investors see many more deals than they

invest in. As a result, it's likely that Chinese investors, in aggregate, have seen *upwards of half* of recent U.S. venture financings; in other words, Chinese investors have a broad view of U.S. innovation across a range of technologies.

Fourth, by investing in early-stage companies, Chinese investors are learning about these foundational technologies *at the same time and at the same rate* that we do--which precludes any time-based advantage for the U.S. with these technologies. Historically, the U.S. military has had exclusive use of critical technology for some period which could be called a period of overmatch; however, we are not likely to have overmatch in the future if China learns about leading-edge technology from U.S. startups at the same time as the U.S. military. Imagine the security predicament the U.S. faces if China gains an appreciable lead in artificial intelligence, to give a specific example. As we know from history, a country achieving overwhelming technological superiority can have a decisive edge in advancing its geopolitical interests just as the U.S. has in the decades after World War II.

Fifth, without the proposed FIRRMA (CFIUS-reform) legislation, there is no monitoring, reporting or control of investments in technologies important for national security by the U.S. government.

Lastly, the Defense Department, In-Q-Tel or other parts of the U.S. government will tend to avoid contact with an early-stage technology company that has a significant level of foreign ownership even if the company is developing technology important for national security. These are six reasons why the scale of Chinese investment in U.S. early-stage technology companies is concerning.

U.S. Tools to Deter Technology Transfer: CFIUS & Export Controls

To mitigate technology transfer from the U.S. there are two primary tools the U.S. government can employ. The first is CFIUS (the Committee on Foreign Investment in the United States) and the second is export controls. Since CFIUS reviews specific deals on a case-by-case basis (rather than systematic assessments of acquisitions or acquirers) and only deals that involve a controlling interest by foreign investors (usually mergers and acquisitions), CFIUS is only partially effective. The proposed FIRRMA legislation makes CFIUS more effective by expanding its jurisdiction to cover more transaction types that could include technology transfer. As I see it, the goal of FIRRMA is not to ensure that more venture capital investments undergo CFIUS review as covered transactions but to ensure that foreign investments are truly passive. For example, Chinese individual investor participation in U.S. venture funds as a limited partner and passive investor is *not* concerning; on the other hand, Chinese firms making direct investments in early-stage technology companies is problematic as the access it provides to

intellectual property, know-how, applications of technology and talent to recruit can serve as a conduit for technology transfer to China. In other words, truly financial passive investments should be welcomed no matter where they are from while strategic investments from China in critical technologies should be viewed differently.

Another concern I've heard mentioned by some individual companies is whether FIRRMA will chill foreign direct investment in the U.S. I do not believe FIRRMA will reduce direct investment from countries *other than China* where acquisitions from Chinese firms are already receiving additional scrutiny from CFIUS. There is no reason to believe that global investment in the U.S. will slow because of FIRRMA apart from Chinese investment.

A further concern expressed by the venture capital community is whether FIRRMA will slow innovation since there will be more scrutiny of Chinese investment. Chinese aggregate investment in U.S. venture capital is on the order of 5% of all dollars invested and is, therefore, too small by itself to significantly reduce the overall investment in early-stage venture-backed companies.

The second tool the U.S. government has to deter foreign technology transfer is export controls and these are complementary to CFIUS since export controls cover *products* rather than access to technology. Some have argued in Congressional testimony that export controls are sufficient without CFIUS reform to deter technology transfer. There are five reasons why I do not believe export controls are a substitute for CFIUS reform:

(1) First, export controls have typically been used for *products*—not *critical technologies*; in fact, I am not aware of any critical technologies—such as artificial intelligence, quantum computing or genomics-based engineering—which are on the export control list even though you can find examples of specific products which include a critical technology.
(2) Second, because export controls typically focus on *products* instead of *technologies*, in general, they will be more backward-looking versus technologies where a national security advantage will be solidified through future development.
(3) Third, export controls require coordination with allies to be effective and this typically takes 2-3 years through the Wassenaar arrangement to gain allied agreement. By that time, development of a critical technology may have already occurred.
(4) Fourth, export controls are ineffective in deterring technology transfer that occurs when China forces companies to form joint ventures in exchange for Chinese market access since these joint ventures inevitably involve transfers of both intellectual property and know-how.
(5) Fifth, it is the company's responsibility to send an inquiry to the Commerce Department to see if it should be governed by an export control as part of the Commercial Control

List. I am skeptical that a Silicon Valley early-stage company is aware of the need for or dedicating the necessary resources to inquire with the Commerce Department to comply.

Both CFIUS reform and export controls are going to be most effective if they are coordinated with each other *and* enforced with allies. Neither is a substitute for the other.

Methods for China's Transfer of Technology

What we found in the course of preparing our DIUx report is that Chinese venture investing is part of a larger story of technology transfer to China--ongoing for decades through both legal and illegal means. To be specific, some of the technology transfer mechanisms China engages in include industrial espionage, cyber theft, forced joint ventures, tracking of open-source innovations, sponsoring professional organizations to target talent and using Chinese foreign national students by placing them to work in sensitive areas of U.S. research. Viewed individually, the legal practices may seem benign but when viewed in combination, and at the scale China is employing them, the composite picture illustrates the intent, design and dedication of a regime focused on technology transfer at a massive scale.

Allowing China unlimited access to U.S.-developed leading-edge technologies not only speeds the decline of *our own* relative technological superiority but may even facilitate *China's* technological ascendance. While strategic competition with China is a long-term threat rather than a short-term crisis, preserving our technological edge is an important national issue today. In fact, the Defense Department is increasingly concerned about the risks today given that:

1. Chinese companies already own significant parts of the military supply chain,
2. Chinese companies already have significant designs of U.S. military equipment as a result of cyber theft and industrial espionage, and
3. China is targeting areas both to catch up to U.S. military capability such as in jet engine aircraft design and areas where China can gain a technology lead--especially where the U.S. military is developing technology through early-stage commercial companies such as in artificial intelligence and quantum computing.

The U.S. government does not have a holistic view--and by that, I mean a coordinated understanding amongst the economic and trade agencies and the purely national security agencies--of how fast this technology transfer is occurring, the level of Chinese investment in U.S. technology, or what technologies we should be protecting.

As a result, given the multiple means of technology transfer China employs today and the rapid pace of technology development, the CFIUS reforms included in FIRRMA are critical to our national security.

Conclusion: Need for Allied Coordination and Investment in Science & Technology

Let me conclude with two important points.

First, any of the steps we take to deter technology transfer from China--which include both CFIUS reform and changes to export controls--needs to be **coordinated with allies** to be effective. Otherwise, we create an incentive for talent and companies to move offshore. Additionally, we simply substitute one of our allies as the target of transferred technology.

Second, while defensive measures like CFIUS reform and better export controls are important, they are not the key to winning a technology race with China. The more concerned we are about the national security threat that China represents, as Chairman of the Joint Chiefs of Staff Dunford indicated when he placed China as the #1 national security threat by 2025, the more important it is to **invest in science and technology, encourage Americans to pursue STEM education and increase federally funded R&D**. To enable the U.S. to win the last technology race with the Soviet Union, federally-funded R&D was 2% of GDP in the 1960s. As China invests a higher percentage of its GDP in R&D as its economy grows faster than ours, U.S. federally-funded R&D has declined today to 0.7% of GDP. We must be proactive to ensure we improve our technology base and innovation capability because our future economic security will be the principal determinant of our national security.

Thank you for your attention to this important issue and I look forward to answering your questions.