

March 19, 2021

Adam Lysenko

Testimony before the U.S.-China Economic and Security Review Commission

**Hearing on U.S. Investment in China's Capital Markets and Military-Industrial Complex**

Panel II: U.S. Investment in China's Stock, Debt, and Venture Capital and Private Equity Markets

*The views expressed in this testimony are the author's alone and do not represent those of any of the organizations with which the author is, or has been, affiliated.*

## Executive Summary

### Background on China's Private Equity Ecosystem

- Thanks to the rapid expansion of venture capital and other private equity investment in China during the last decade, China is now home to a significant total of global private equity investment each year. In 2020, more than 20% of global venture capital investment dollars funded startups in China, and about 6% of announced non-venture capital PE deals by investment value involved target companies in China. China's position as a magnet for venture capital investment is particularly striking given that only a few percent of total global venture capital dollars flowed to Chinese startups before 2010.
- In 2020, 54% of all venture capital transactions measured by total invested capital included at least one offshore investor, with the US participation rate at 29%. These totals exclude US and other foreign limited partner investment through VC funds managed by general partners from China, which have directed billions of additional dollars of foreign capital to Chinese startups over the last two decades as well. By total announced investment, foreign non-venture capital PE investors matched or narrowly outspent their onshore Chinese counterparts in each of the last two years, making foreign investors relatively more heavyweight players in China's non-venture capital private equity ecosystem.
- The mix of foreign private equity investors in China has historically been dominated by professional private equity fund managers reliant on capital from passive third-party institutional, high-net-worth, and other investors like life insurers, pension funds, and family offices. By total investment value, professionally managed foreign PE funds participated in 92% of all venture capital and 82% of all private equity transactions in China involving foreign investors in 2020. Corporations are the second-most common foreign investor type in China's private equity space. In 2020 these entities took part in 15% of Chinese venture capital transactions and 34% of other Chinese private equity transactions with foreign participants by total investment value. Corporate private equity investors have a more complex set of strategic investment drivers.

### Relation to China's Technology Acquisition Efforts

- Under the leadership of Xi Jinping, China has accelerated an unprecedented whole-of-society effort to advance its strategic technological capabilities and leapfrog over established dominant players at the edge of the global innovation frontier. China's multifaceted technology transfer strategy

includes fostering foreign inbound venture capital investment as one of numerous elements. This alone is worthy of policy consideration, regardless of whether a careful weighing of benefits and risks finds that there are unacceptable costs to foreign participation in China's private equity ecosystem and particularly to foreign investment in Chinese technology firms.

- The most important reliance China's startups have on foreign talent is their dependence on Chinese entrepreneurs and engineers who have studied abroad or worked for foreign firms before returning to China. By the end of 2019, 4.2 million out of 4.9 million Chinese nationals (86%) had gone home after completing studies abroad, giving China an infusion of nearly 4 million new workers with overseas training or experience from 2009 to 2019. And external survey data indicate close to an additional 1 million Chinese nationals returned home in 2020 thanks to travel restrictions tied to the COVID-19 pandemic as well as more onerous immigration and visa policies in places like the United States.
- Another important foreign cohort supporting China's technology startups consists of foreign engineers at research and development centers in international technology clusters found in the United States and other developed economies. Chinese companies operating on the global frontiers of emerging technology areas are especially reliant on these overseas operations. For example, many of China's most ambitious autonomous driving technology companies have significant R&D presences in the United States with dozens or even hundreds of employees in Silicon Valley and other locations.

## US Policy Implications

- The US government needs to lead out on crafting solutions to challenges presented by China's state-led, market-oriented overseas technology acquisition strategy. Free markets cannot address these challenges effectively on their own because China is using its influence to alter domestic and foreign economic actors' incentives within free markets to foster its own desired outcomes at the expense of US and other foreign interests. US economic actors are not fully internalizing the costs of their behaviors vis-à-vis China because they do not have to directly bear those costs.
- Government can fill this leadership role in three important ways:
  - (1) Bring transparency and awareness to China's overseas economic statecraft ambitions and strategies.** Government can help private market participants better price the risks of engaging with China across various economic conduits by tracking, understanding, and educating on China's evolving efforts to acquire foreign technologies and expertise. Even today, there remains a worrying lack of understanding among many US research institutions, multinational corporations, financial investors, and others about the scope and purpose of China's global technology acquisition strategy.
  - (2) Counter the distorted economic incentives China has introduced into international markets with appropriate policy.** Understanding and informing private market actors about China's technology acquisition strategies will not be enough alone – absent any regulatory or economic consequences, US and other foreign players will still make decisions that harm long-term US interests in exchange for short-term economic gains. As it contemplates policy and regulatory solutions, the US government should prioritize its efforts based on China's evolving strategies

and observed real world behaviors and should pursue steps that are targeted and precise instead of blunt and unnecessarily self-harming. This is not to say that the scope of any solution will be small; the threat China poses to US interests through its technology acquisition programs is measured in the trillions of dollars in terms of both resources committed by China and potential costs to the United States.

**(3) Adopt policies to promote innovation and keep the United States the world's leading technological power.** The United States owes its current position at the pinnacle of the global technology ladder to a social and economic environment that has been highly conducive to innovation over many decades. As the United States considers policy responses to China's efforts to acquire foreign technological expertise, we should remember that no amount of preventative action to keep technology transfer at bay can maintain the United States at the forefront of the global technological frontier if the United States loses its position as the most attractive destination for innovators from around the world. An ample body of academic literature exists illuminating the kinds of support needed to maintain a competitive innovation ecosystem, from public funding and tax credits to building human capital through progressive immigration rules and a focus on STEM educational capacities. China is competing with the United States to become a center of global innovation, and the United States must outcompete in these realms if it is to maintain its long-term technological edge.

## 1. Describe the evolution of China's private equity and venture capital markets, including foreign participation therein.

Private equity (PE) investment, which includes venture capital (VC) investment in high-growth startups as a major subset, has a shorter history in China than it does in the United States and in many other advanced economies.<sup>1</sup> Before the 2000s, China lacked the policy environment and financial development needed to foster a large, thriving private equity ecosystem. Foreign financial investment inflows were also tightly restricted. Early foreign venture investments in Chinese firms such as Softbank's storied \$20 million stake in Alibaba in early 2000 were carried out through investments in offshore holding companies instead of directly in mainland Chinese firms, circumventing prohibitive onshore regulatory structures.<sup>2</sup>

Beijing only started to formulate the basic regulatory frameworks necessary for direct onshore venture capital and other private equity investments in the early 2000s.<sup>3</sup> Substantial reforms in the following years paved the way for the maturation and expansion of China's private equity ecosystem for both domestic and foreign investors. For example, authorities legalized the limited partnership structure commonly used in the private equity space first for domestic investors and then for foreign investors in the mid- and late-2000s.<sup>4,5</sup> China also began implementing pilots of Qualified Foreign Limited Partners (QFLP) programs in 2010, providing additional ease in fund partnership establishment, operation and exit.<sup>6</sup>

Thanks to developments like these, private equity investment activity in China accelerated beginning in the late 2000s (Figure 1). At first, the most private equity investment dollars flowed through non-venture PE transactions with foreign investors. Notable examples included Temasek's \$1.5 billion stake in Bank of China and Bank of America's \$2.5 billion investment in China Construction Bank prior to the Chinese firms' IPOs in the mid-2000s. China's venture capital market took off thereafter in the late 2000s and 2010s. By 2016 there were more than \$140 billion in annual venture capital and other private equity investments being announced in China each year. This activity peaked in 2018 with around 6,000 venture capital transactions and more than 200 other private equity deals worth nearly \$230 billion.

---

<sup>1</sup> This testimony relies heavily on the following report, which I draw from hereafter without additional specific attribution:

Lysenko, Adam, Thilo Hanemann, and Daniel Rosen, *Disruption: US-China Venture Capital in a New Era of Strategic Competition*, Rhodium Group, January 2020, available at: <https://www.us-china-investment.org/research>.

<sup>2</sup> Henny Sender and Connie LingStaff, "Softbank to Invest \$20 Million In Hong Kong's Alibaba.com", Wall Street Journal, 18 January 2000, available at: <https://www.wsj.com/articles/SB948202996877749173>.

<sup>3</sup> For example, see: Ministry of Commerce, *Administrative Regulations on Foreign-Invested Venture Capital Enterprises* "外商投资创业投资企业管理规定", October 2002, available at: <http://www.mofcom.gov.cn/article/swfg/swfgbl/201101/20110107348941.shtml>.

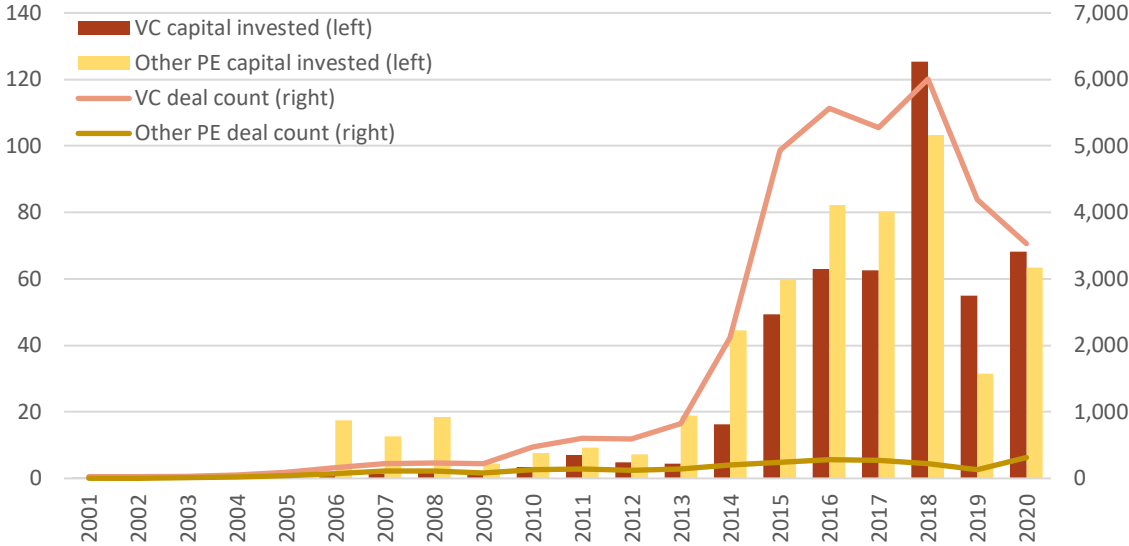
<sup>4</sup> Central People's Government of the PRC, *Partnership Law of the People's Republic of China* "中华人民共和国合伙企业法", August 2006, available at: [http://www.gov.cn/flfg/2006-08/28/content\\_371399.htm](http://www.gov.cn/flfg/2006-08/28/content_371399.htm).

<sup>5</sup> State Council, *Administrative Measures for the Establishment of Partnership Enterprises by Foreign Entities or Individuals in China* "外国企业或者个人在中国境内设立合伙企业管理办法", November 2009, available at: [http://www.gov.cn/zwfgk/2009-12/02/content\\_1478238.htm](http://www.gov.cn/zwfgk/2009-12/02/content_1478238.htm).

<sup>6</sup> Shanghai Municipal Government, *Shanghai Implementing Measures on the Launch of the Pilot Programme for Foreign-Invested Equity Investment Enterprises in Shanghai* "关于本市开展外商投资股权投资企业试点工作的实施办法", December 2010, available at: <http://www.sficc.com/article.php?id=1338>.

Beginning around mid-2018, frothiness in Chinese venture and technology markets and changing policy variables in China and abroad combined to steer private equity investment activity lower compared to the record highs in 2018. Fears about Chinese macroeconomic health and a growing consensus that many startups were pursuing unsustainable top line growth without viable routes to profitability led to a sharp contraction in venture fundraising. IPO valuations also came under pressure, with notable Chinese firms like Xiaomi seeing their market values fall after their public listings. These conditions eased in 2020, and private equity investment in China recovered somewhat following the 2019 declines back to levels typical between 2015 and 2017.

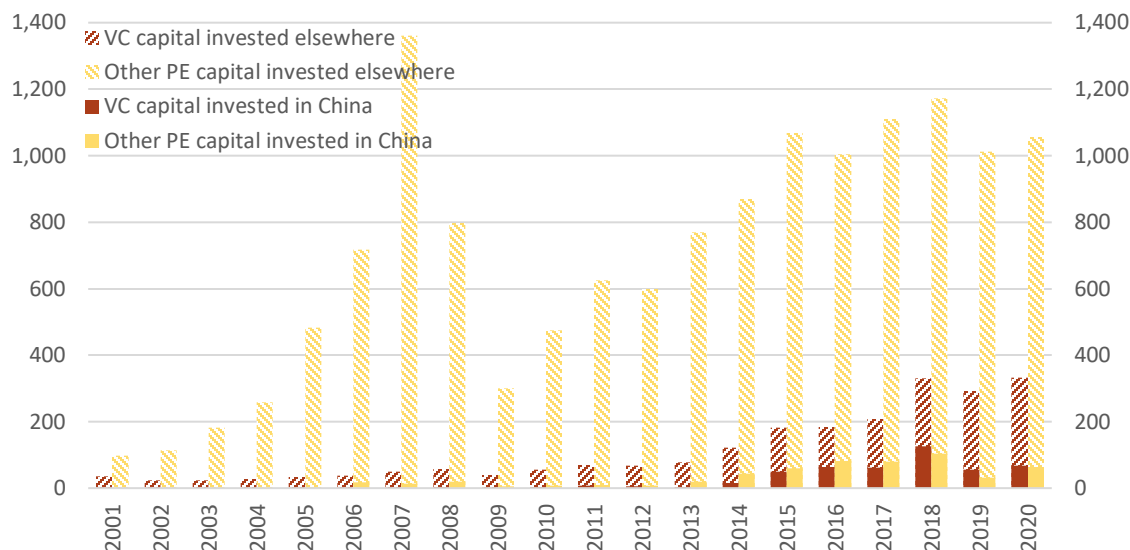
**Figure 1: Announced Venture Capital and Other Private Equity Investment in China, 2001 – 2020**  
 USD billions (left); Deal count (right)



Source: Pitchbook.

Thanks to the rapid expansion of venture capital and other private equity investment in China during the last decade, China is now home to a significant total of global private equity investment each year (Figure 2). In 2020, more than 20% of global venture capital investment dollars funded startups in China (down from a peak of almost 40% in 2018), and about 6% of globally announced non-venture capital PE deals by investment value involved target companies in China (down from a peak of almost 9% in 2018). China’s position as a magnet for venture capital investment is particularly striking given that only a few percent of total global venture capital dollars targeted Chinese startups before 2010.

**Figure 2: Announced Global Venture Capital and Other Private Equity Investment, 2001 – 2020**  
USD billions

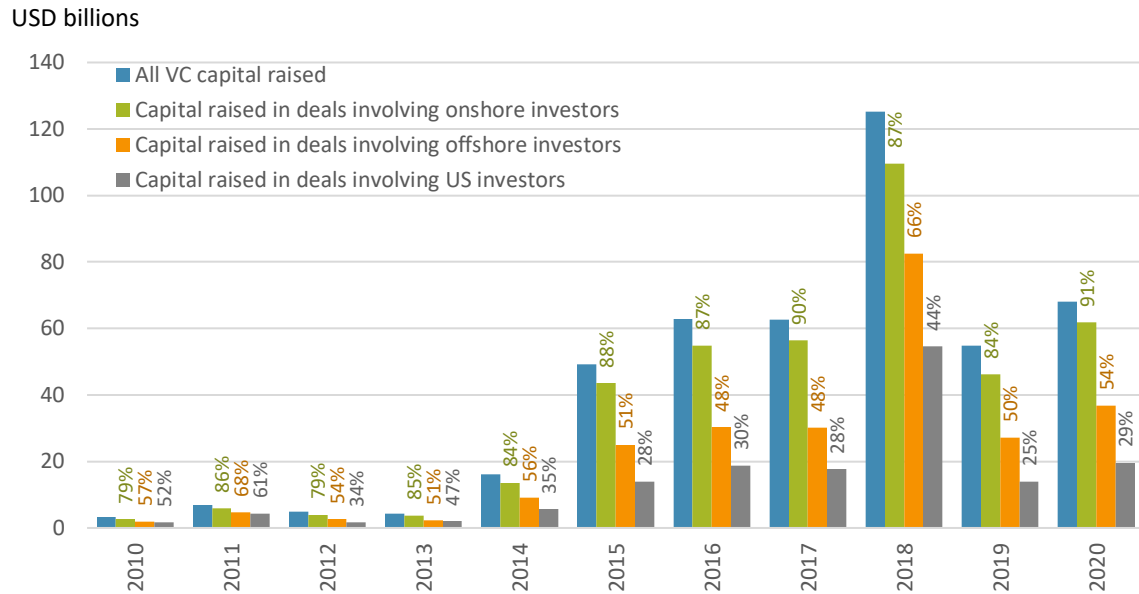


Source: Pitchbook.

Foreign investors have played an outsized role in the development of China’s private equity and venture capital ecosystems from the earliest days. In the venture capital space, essentially all of China’s leading first-wave technology firms like Alibaba, Tencent, and Baidu received financing from US and other foreign venture investors in the late 1990s and early 2000s. Foreign investors continued participating in many of the largest venture fundraising rounds for Chinese startups in the years that followed. In 2020, 54% of all transactions measured by total invested capital included at least one offshore investor, with the US participation rate at 29% (Figure 3). These totals exclude US and other foreign limited partner investment through VC funds managed by general partners from China such as Hillhouse Capital, Primavera Capital, and Hony Capital, which have directed billions of additional dollars of foreign capital to Chinese startups over the last two decades as well. By transaction counts, foreign participation in China’s venture capital market has historically been a bit lower, reflecting foreign investors’ tendency to participate in larger, higher-profile deals. In 2020, 16% of venture fundraising rounds for Chinese startups involved at least one foreign investor, and 8% included at least one investor from the United States.

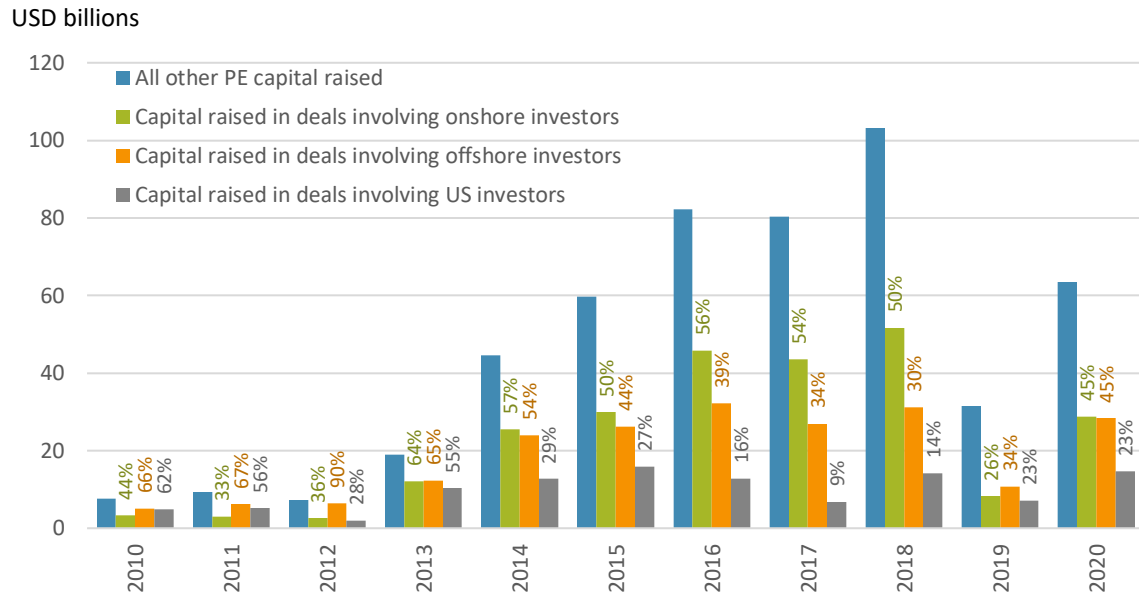
Foreign investors have also been important players in China’s non-venture capital private equity market, although patterns of foreign and domestic participation and overlap differ somewhat from the venture capital space (Figure 4). In the venture capital realm, onshore investors have taken part in most deals in China over the last decade, with annual participation rates between 70% and 90% measured by either total investment value or by transaction count. In contrast, onshore investor participation rates for other private equity transactions have been closer to 50% in recent years, with foreign participation rates not far behind. By total announced investment, foreign non-venture capital PE investors even matched or narrowly outspent their onshore Chinese counterparts in each of the last two years, making foreign investors relatively more heavyweight players in China’s non-venture capital private equity ecosystem. This is partly a result of how private equity transactions involving mature companies tend to include fewer investors in each transaction, which reduces onshore and offshore investor overlap. It also highlights the stunning speed at which China has been able to develop a deep bench of onshore venture capital investors with ample access to capital over the last decade.

**Figure 3: Announced Venture Capital Investments in China by Investor Location, 2010 – 2020**



Source: Pitchbook. Figures may not sum to 100% due to multiple investors participating in the same transactions, missing data on investor locations, etc.

**Figure 4: Announced Other Private Equity Investment in China by Investor Location, 2010 – 2020**



Source: Pitchbook. Figures may not sum to 100% due to multiple investors participating in the same transactions, missing data on investor locations, etc.

The mix of foreign private equity investors in China has historically been dominated by professional private equity fund managers reliant on capital from passive third-party institutional, high-net-worth, and other investors like life insurers, pension funds, and family offices. These investors generally structure their funds as tax-haven domiciled limited partnerships with the PE fund managers retaining discretion over capital deployment as general partners. Fund managers' primary goals are to increase

their portfolio companies' value and generate financial returns for their limited partners, who in turn pay asset management and performance fees. As PE fund managers must compete to attract third-party capital, developing a strong track record of financial returns is the most important component of their long-term commercial viability and is the most prominent driver of investment decision-making.

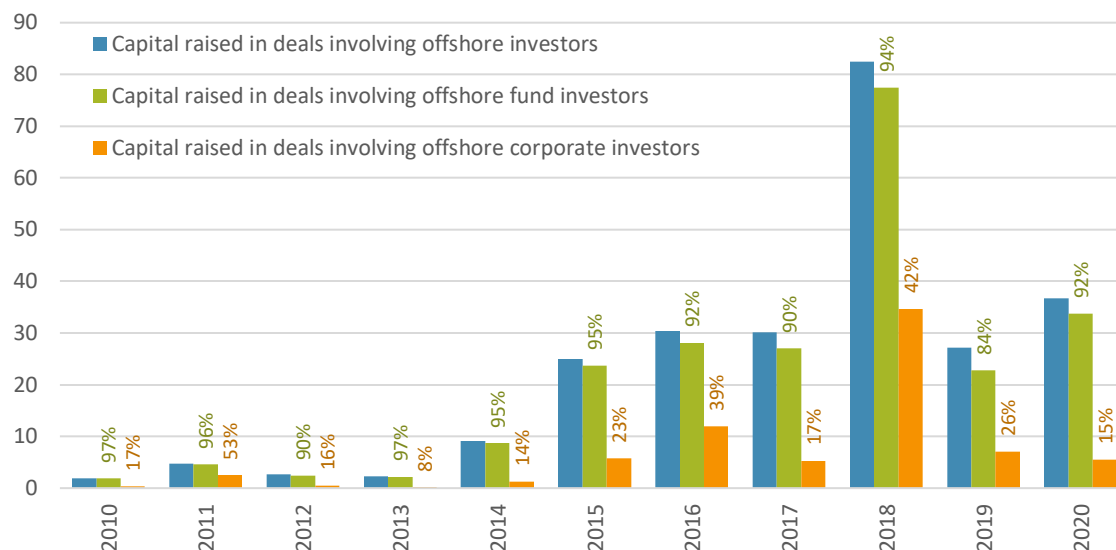
Given these incentives, it is not surprising that foreign PE fund managers have found China to be such an exciting investment destination over the last two decades. The enviable performances of several of China's first- and second-wave tech startups like Alibaba, JD.com, and Xiaomi have served as a powerful draw for more recent investors seeking to replicate early successes, and PE fund managers have found many lucrative opportunities within China's burgeoning technology startup ecosystem tied to China's massive and growing web-connected population in the years since. Moreover, private equity investment in China has emerged as an important diversifying tool for US and other global investors seeking the benefits of imperfect correlation with other global asset classes and markets. By total investment value, professionally managed foreign PE funds participated in 92% of all venture capital and 82% of all private equity transactions in China involving foreign investors in 2020 (Figures 5 and 6). Examples of active foreign fund PE investors in China include Walden International, Kleiner Perkins, or Tiger Global Management in the venture capital space and Carlyle Group, Warburg Pincus, or Morgan Stanley in the non-venture capital private equity realm.

Corporations are the second-most common foreign investor type in China's private equity space. In 2020 these entities took part in 15% of Chinese venture capital transactions and 34% of other Chinese private equity transactions with foreign participants by total investment value. Corporate private equity investors have a more complex set of investment drivers compared to professional PE fund managers, which are usually overwhelmingly focused with financial performance. And while corporate PE investors are sensitive to financial losses, without third-party investors to compete for or a set timeframe for exiting investments they generally have more flexibility to explore commercial and strategic synergies with investment targets. For example, a foreign corporate venture investor might make strategic investments in Chinese startups developing new technologies or business models to bolster the investing corporation's competitive position in China and abroad or to support the development of future demand for the company's products. Examples of active foreign corporate PE investors in China include Intel Capital, Foxconn, or CyberAgent Capital in the venture capital space and Amgen or Danone in the non-venture capital private equity realm.

Compared to professional PE funds and corporate investors, other foreign investor types have generally played more marginal roles in China's private equity ecosystem. Examples include angels, accelerators, and other pre-early-stage investors; funds of funds; direct institutional investors; government-affiliated venture investors; and so on. Investment goals, niches, and time horizons vary by each of these players.

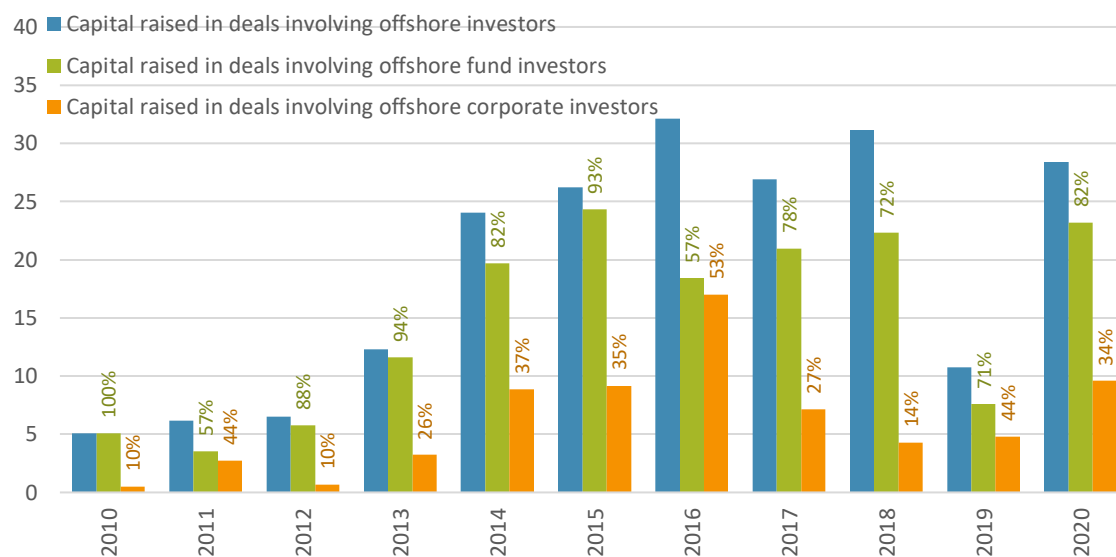


**Figure 5: Announced Venture Capital Investment in China by Foreign Investor Type, 2010 – 2020**  
USD billions



Source: Pitchbook. Figures may not sum to 100% due to multiple investors participating in the same transactions, missing data on investor types, etc.

**Figure 6: Announced Other Private Equity Investment in China by Foreign Investor Type, 2010 – 2020**  
USD billions



Source: Pitchbook. Figures may not sum to 100% due to multiple investors participating in the same transactions, missing data on investor types, etc.

### 1.1 Beyond capital, what do Chinese firms get from working with foreign investors?

Regardless of investor type or their underlying financial or strategic motives, most foreign PE investors take stakes in Chinese firms hoping that those companies will be commercially successful. Therefore, foreign PE investors have strong motivations to support their Chinese portfolio companies with resources other than just investment capital to maximize the likelihood of profitable investment exits

and other outcomes including development of new technologies, business models, and future revenue streams. Therefore, virtually all private equity investors try to offer networking support to connect portfolio companies with prospective customers and employees, subject matter experts, potential follow-on investors, and any others who may be able to help the portfolio companies succeed. Investors may also offer support in helping Chinese startups access foreign end markets, for example by assisting them in navigating unfamiliar foreign legal and regulatory regimes. To the extent a foreign PE investor has in-house technical expertise or other unique resources (e.g. if the investor is a real-economy technology corporation), it may also directly offer technical support to portfolio companies to enable faster product or technology development and commercialization.

## 1.2 What is the government's footprint in directing capital flows and the investment agenda in China's startup ecosystem?

The Chinese government directs investment flows to Chinese startups through industrial policy programs, by providing the promise of lucrative revenue opportunities via government procurement, and by controlling whether foreign entities may invest in specific industry and technology areas through the use of formal and informal market access restrictions.

### Industrial Policy Programs

China regularly signals its state technology development priorities to private market participants via industrial policy pronouncements that include details on specific technologies of interest, development goals, commercialization timeframes, and so forth. Prominent examples from recent years include the *Guidelines to Promote National Integrated Circuit Industry* (National IC Plan) released in 2014 and the *Made in China 2025* domestic manufacturing development plan published in 2015. Industrial policy signaling pronouncements like these encourage startup formation among entrepreneurs who anticipate favorable regulatory treatment and other benefits for supporting China's strategic technology development ambitions. Both domestic and foreign investors may in turn anticipate brighter outlooks for Chinese startups in covered technology areas, directing capital to related firms in China.

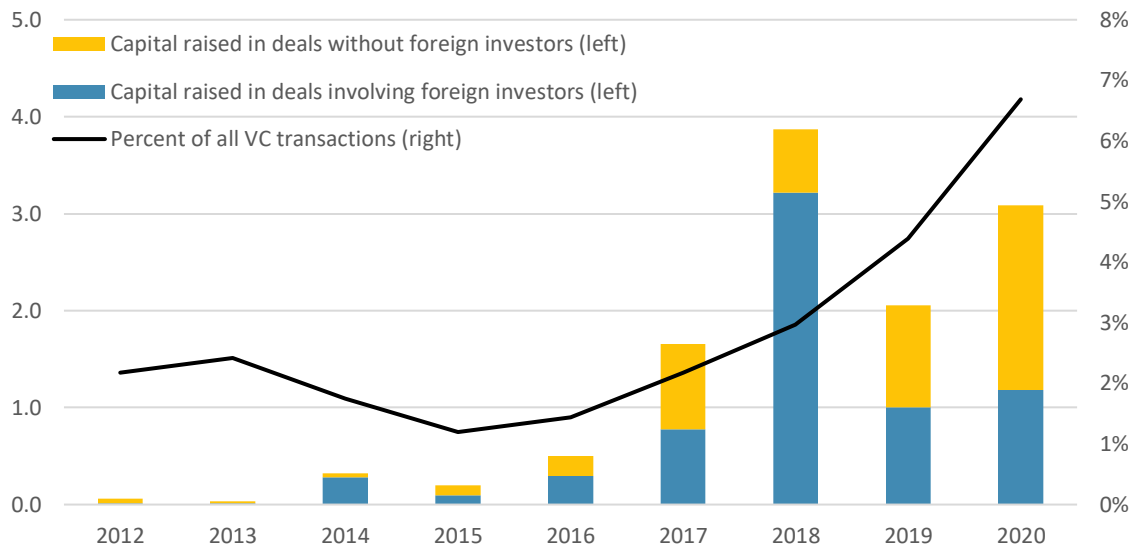
The Chinese government also organizes deployment of vast capital troves to invest in priority technology areas in tandem with these industrial policy pronouncements. These state-directed venture capital investment funds undoubtedly impact the Chinese venture capital ecosystem and the behaviors of its domestic and foreign participants. Nominally, Chinese venture investment government guidance funds have raised astronomical sums to invest in Chinese technology startups – as of early 2020 Chinese officials had established more than 1,700 government guidance investment funds with a registered target size of 11 trillion RMB (1.55 trillion USD), although these funds had actually only raised less than \$700 billion.<sup>7</sup> For context, in 2020 there were only about \$130 billion in total venture capital and other private equity transactions announced in China, roughly a quarter of total capital reportedly raised by China's venture capital government guidance funds. Although actual capital deployment has likely been only a fraction of these totals, upward pressure on technology startup valuations and the existence of potential government buyers as exit counterparties have likely encouraged investment within areas of China's venture capital ecosystem where government funds have been active.

---

<sup>7</sup> Luong, Ngor, Zachary Arnold, and Ben Murphy, *Understanding Chinese Government Guidance Funds: An Analysis of Chinese-Language Sources*, Center for Strategic and Emerging Technology, March 2021, available at: <https://cset.georgetown.edu/research/understanding-chinese-government-guidance-funds/>.

As far as quantifying the impacts of Chinese industrial policy on venture capital activity, there have been quantifiable increases in venture capital investment in areas heavily promoted as part of China’s industrial policy efforts, although it is difficult to definitively prove causation. For example, since China introduced the National IC plan in 2014 and formed the National Integrated Circuit Industry Investment Fund to invest in domestic chip capabilities, annual venture capital investment in Chinese semiconductor firms grew more than tenfold from \$0.3 billion to a peak of \$3.9 billion in 2018 (Figure 7). The 2020 total was only slightly lower at \$3.1 billion. In addition, the percentage of all venture investments in Chinese startups targeting companies in the chip space increased from less than 2% in 2014 to 7% in 2020.

**Figure 7: Announced Venture Capital Investment in Chinese Semiconductor Startups, 2012 – 2020**  
USD billions (left), percent of all VC transactions in China (right)



Source: Pitchbook.

### Procurement Opportunities

Outside of explicit industrial policy efforts, Chinese government entities also direct the flow of capital to certain technology segments through procurement spend. For example, by creating a massive end market for surveillance technology products used to monitor Chinese citizen’s behaviors, including the activities of ethnic minorities in regions like Xinjiang, the Chinese government has created lucrative revenue opportunities for related technology startups like facial recognition software technology company SenseTime, surveillance software and camera provider Hikvision, and voice recognition technology company iFlytek. Many of these firms have drawn investment from foreign venture players. For example, Intel Capital was an early investor in iFlytek<sup>8</sup>, Qualcomm Ventures took a stake in

<sup>8</sup> As per Pitchbook, iFlytek’s full list of historical investors includes IPV Capital, Intel Capital, Keda Holdings, Legend Capital, Fosun Venture Capital Investment, China Mobile, Anhui Railway Development Fund, and Cybernaut (China) investment.

SenseTime<sup>9</sup>, and Australia’s Macquarie Group is an investor in facial recognition technology firm Megvii<sup>10</sup>.

## Market Access Restrictions

Foreign venture capital investors in China are subject to China’s foreign investment regulatory regimes, which include substantial formal equity caps and other formal restrictions in certain sectors. Foreign VC investors also often face informal restrictions and discrimination. There have been some liberalizing reforms in recent years including progress towards lifting existing restrictions on foreign investment by reducing the list of restricted sectors on China’s Negative List and providing a more level playing field through a new FDI law. However, other steps have been more regressive. For example, China introduced an onerous new cyber security regime and new mechanisms such as national security reviews for foreign investment. In all, Chinese authorities maintain numerous tools they can use to direct foreign participation in local technology niches, including through venture capital investment.

### 1.3 What are the Chinese government’s objectives?

The Chinese government has two principal goals in influencing China’s venture capital market: bolstering China’s technological competitiveness and safeguarding against systemic financial risks.

#### Bolstering Technological Competitiveness

Under the leadership of Xi Jinping, China has accelerated an unprecedented whole-of-society effort to advance its strategic technological capabilities and leapfrog over established dominant players at the edge of the global innovation frontier. The last few years have only seen an intensification and centralization of these efforts: China is inching closer towards – not away from – a model of state-driven strategic technology acquisition that challenges established global economic norms and US interests. For example, after cataloging major growth in the number of state-run technology conversion enclaves, Sino-foreign science and technology professional organizations, outreach organizations, transfer programs, and other facilitators from 2013 to 2019, William Hannas and Huey-Meei Chang recently noted that “there is little ground to support a belief that growth in China’s indigenous innovation—if it is happening at all—is accompanied by a decline in China’s predatory transfer behavior.”<sup>11</sup> As long as the

---

<sup>9</sup> As per Pitchbook, SenseTime’s full list of historical investors includes 5Y Capital, Advantech Capital Partners, Alibaba Group, All-Stars Investment, Alpha Intelligence Capital Fund, Alumni Ventures Group, Bank of China Group Investment, Beyond Ventures, CDH Investments, China Everbright, China International Capital Corporation, China Merchants Securities, Co-Stone Capital, Dalian Wanda Group, Fidelity International, Francis Leung, Glade Brook Capital Partners, Hopu Investment Management, Huarong Intl Financial, Huaxing Fund, IDG Capital, Infore Investment Holding Group, Orient Securities Company, Qualcomm Ventures, Sagamore Investments, Sailing Capital, Shanghai Free Trade Zone Equity Fund, Shanghai Shimao Company, Silver Lake Management, Singtel Innov8, SoftBank Investment Advisers, Star VC, Suning Company, TCL Venture Capital, Temasek Holdings, Tiger Global Management, and Zhongping Guoyu Asset Management.

<sup>10</sup> As per Pitchbook, Megvii’s full list of historical investors includes Alibaba Group, Ant Group, Bank of China Group Investment, Boyu Capital, CCB International, China State-Owned Assets Supervision & Admn Commission, Comet Labs, GGV Capital, Hon Hai Precision, ICBC Financial Asset Investment, Legend Star, Lenovo Capital and Incubator Group, Macquarie Group, New Alliance Capital, Qiming Venture Partners, Russia-China Investment Fund, Sinovention Ventures, SK Group, Sunshine Insurance Group, and The Abu Dhabi Investment Authority.

<sup>11</sup> William C. Hannas and Huey-Meei Chang, “Chinese Technology Transfer: An Introduction”, *China’s Quest for Foreign Technology*, ed. by William C. Hannas and Didi Kirsten Tatlow (Routledge, 2020).

United States and other global innovation leaders continue to leave doors open for China to siphon away technology and knowhow, whether licitly or illicitly, China will continue to avail itself of those opportunities.

The *State Council Notice on the Publication of the Program to Build a National Technology Transfer System* released in September 2017 articulates China’s vision for a multifaceted technology transfer strategy, which includes fostering foreign inbound venture capital investment as one of numerous explicitly identified elements.<sup>12</sup> The notice encourages local governments and other stakeholders to “guide enterprises towards establishing international technology management companies and overseas research and development centers; launch cooperation with foreign technology transfer organizations, business incubation organizations, and start-up investment organizations.” US and other foreign investors may debate the real-world efficacy or actual practical risks of China’s ambitions in the inbound technology investment space, but there should be no confusion around China’s stated hope to leverage inbound investment in technology startups to promote China’s strategic technological capabilities.

### Maintain Systemic Financial Stability

Beyond technological development goals, Chinese authorities are also very sensitive to perceived risks to financial market stability, and regulators have demonstrated willingness to sacrifice near-term startup formation rates and stomach downdrafts in valuations in order to combat financial risks. For example, a key driver of the 2019 downturn in China’s venture fundraising activity was Beijing’s deleveraging campaign, which depressed major sources of capital for onshore venture fund formation as part of its crackdown on domestic financial excesses. The loss of these capital sources reverberated through China’s venture capital ecosystem, contributing to a sharp drop in new fundraising and a downward adjustment to tech valuations. Similarly, China tightly controls the inflow and outflow of foreign portfolio investment, and in conditions of systemic financial stress has made it difficult for foreign investors to freely move capital as they enter and exit onshore investment positions.

## 2. Differentiate the risks to the United States of passive portfolio investment in Chinese securities versus private equity and venture capital investment.

Both foreign private equity and foreign passive securities investments provide Chinese firms with capital that may be used in ways that are detrimental to US interests or values (although it is certainly not just Chinese firms that this dynamic applies to – individual American firms also sometimes make decisions that are harmful to US interests). But beyond providing capital, private equity investment also often includes an active component of support for Chinese portfolio companies. Depending on the investor, this support may be much less fungible than the capital provided and may promote development of an investment target’s business or technology capacity more efficiently than would be possible otherwise.

### 2.1 What separates the risks of U.S. investor participation in China’s private equity and venture capital markets from those in other emerging markets?

---

<sup>12</sup> State Council, *State Council Notice on the Publication of the Program to Build a National Technology Transfer System* “国务院关于印发国家技术转移体系建设方案的通知”, September 2017, available at: [https://cset.georgetown.edu/wp-content/uploads/t0069\\_China\\_tech\\_transfer\\_system\\_EN.pdf](https://cset.georgetown.edu/wp-content/uploads/t0069_China_tech_transfer_system_EN.pdf).

China is an ideological and strategic competitor with the United States, and no other nation has ever engineered such a massive state-led, whole-of-society approach to pursuing dominance in strategic technology areas like China has. I have serious concerns about how the world might change if China were ever able to displace the United States as a global technological and strategic power and more forcefully project its models of economic and societal governance abroad. China's ambitions in this regard are alone worthy of consideration, regardless of whether a careful weighing of benefits and risks finds that on net there are unacceptable costs to any of the myriad economic linkages China has forged with the world, including foreign investment in Chinese technology startups. Similar investments in other regions simply do not entail comparable great-power competition considerations involving a US ideological competitor of China's stature and single-mindedness.

### 3. Describe the activities of U.S. and other multinational firms in co-investing with Chinese entities in Chinese tech startups.

As shown in Figure 3 above, co-investment in Chinese startups among foreign and domestic venture investors is very common. This is a natural result of the increasing sophistication of China's professional venture capital investors, the continued interest among foreign venture investors in the Chinese market, and the fact that most venture capital fundraising rounds include multiple investors. In most recent years, at least 80% - 90% of fundraising rounds for Chinese startups have involved at least one investor from mainland China, while at least 40% - 50% of transactions have included at least one foreign investor.

#### 3.1 Beyond financial resources, what else do these firms provide to Chinese start-ups, and what risks might such exchanges create for the United States?

I refer readers to my comments in section 1.1 above.

### 4. How dependent is China's startup ecosystem on foreign managerial expertise and engineering talent, particularly in high tech sectors?

The most important reliance China's startups have on foreign talent is their dependence on Chinese entrepreneurs and engineers who have studied abroad or worked for foreign firms before returning to China. These "Hai Gui" individuals (also colloquially called "Sea Turtles" due to a homophonic pronunciation in Chinese) far outnumber any other cohorts of foreign managers or engineers supporting China's technology sector, and they have been a key ingredient in vitalizing China's domestic technology startup environment over the last decade.

Data from China's Ministry of Education illustrate the scale of China's Hai Gui population. At the end of 2009, a little under half a million Chinese nationals had completed overseas studies and returned to China, representing 62% of all those who had gone to study abroad at the time. Just ten years later at the end of 2019, 4.2 million out of 4.9 million Chinese nationals (86%) had returned home after completing studies abroad, giving China an infusion of nearly 4 million new workers with overseas

training or experience from 2009 to 2019.<sup>13,14</sup> And external survey data indicate close to an additional 1 million Chinese nationals subsequently returned home in 2020 thanks to travel restrictions tied to the COVID-19 pandemic as well as more onerous immigration and visa policies in places like the United States.<sup>15</sup>

Chinese entrepreneurs who have studied abroad or worked for foreign firms continue to account for a significant minority of new technology startup formations in China, including many companies that have drawn US scrutiny in recent years. For example, Tang Xiao'ou and Xu Li both worked at Microsoft Research Asia prior to establishing SenseTime. Megvii founder Yin Qi is a Columbia university computer science alumnus. And CloudMinds co-founders Robert Zhang and Bill Huang are likewise both US educated. Each of these firms is now on the Commerce Department's Entity List.

Another important foreign cohort supporting China's technology startups consists of foreign engineers at research and development centers in international technology clusters found in the United States and other developed economies. Chinese companies operating on the global frontiers of emerging technology areas are especially reliant on these overseas operations. For example, many of China's most ambitious autonomous driving technology companies like Pony.ai, TuSimple, and Baidu have significant R&D presences in the United States with dozens or even hundreds of employees in Silicon Valley and other locations. AMD's fabless semiconductor joint venture in China (which was added to the Entity List in 2019) has an R&D operation in Texas. Huawei has an expanding artificial intelligence-focused research presence in the United Kingdom. And Entity List member Hikvision has an R&D center in Canada.

#### 4.1 How are heightened geopolitical tensions impacting these kinds of knowledge transfers, and what other factors may be driving these changes?

Studies have shown that Chinese nationals who have gone to school or worked abroad have tended to decide whether to remain abroad or return to China based heavily on the balance of financial opportunities in each jurisdiction.<sup>16</sup> Other considerations like cultural preferences and the degree Chinese nationals feel welcome abroad undoubtedly also play a role, along with each individual's personal relationship with and feelings towards the Chinese state. The fact that the percentage of overseas Chinese nationals returning to China after studying or working abroad has risen substantially in the last decade reflects both a growth in new opportunities for these individuals in China and also a relative deterioration of their opportunity sets abroad.

---

<sup>13</sup> Ministry of Education of the People's Republic of China, *The Ministry of Education announces the statistical results of all kinds of overseas students in 2009* “教育部公布 2009 年度各类留学人员情况统计结果”, June 2010, available at: [http://www.moe.gov.cn/s78/A20/gjs\\_left/moe\\_851/201006/t20100628\\_90108.html](http://www.moe.gov.cn/s78/A20/gjs_left/moe_851/201006/t20100628_90108.html).

<sup>14</sup> Ministry of Education of the People's Republic of China, *Statistics of students studying abroad in 2019* “2019 年度出国留学人员情况统计”, December 2020, available at: [http://www.moe.gov.cn/jyb\\_xwfb/gzdt\\_gzdt/s5987/202012/t20201214\\_505447.html](http://www.moe.gov.cn/jyb_xwfb/gzdt_gzdt/s5987/202012/t20201214_505447.html).

<sup>15</sup> He Huifeng, “China's overseas graduates return in record numbers into already crowded domestic job market”, South China Morning Post, 21 September 2020, available at: <https://www.scmp.com/economy/china-economy/article/3102384/chinas-overseas-graduates-return-record-numbers-already>.

<sup>16</sup> Zeithammer, Robert and Ryan Kellogg, *The Hesitant Hai Gui: Return-Migration Preferences of U.S.-Educated Chinese Scientists and Engineers*, Journal of Marketing Research, Vol. 50, No. 5 (October 2013), pp. 644-663, available at: [https://www.anderson.ucla.edu/faculty\\_pages/robert.zeithammer/HesitantHaiGuiJMR.pdf](https://www.anderson.ucla.edu/faculty_pages/robert.zeithammer/HesitantHaiGuiJMR.pdf).

Escalating US-China tensions have unambiguously made the United States a less attractive place for Chinese engineers and entrepreneurs to live and work over the last few years, partly explaining the accelerated rate of overseas Chinese talent returning to China. This trend may prove costly to the United States in the long run. As a recent report from the National Security Commission on Artificial Intelligence found, attracting and retaining foreign engineering talent, *including from China*, is an important ingredient in maintaining overall US technology competitiveness.<sup>17</sup> Keeping talented Chinese entrepreneurs and engineers engaged in the United States prevents them from pursuing endeavors in China that may be harmful to US interests.

New regulatory policies and an environment of heightened geopolitical tensions have also impacted Chinese technology firms' reliance on foreign research and development outposts, but the net effect has so far entailed more substitution and reorganizing across international borders than wholesale withdrawal from foreign R&D investment. For example, the Export Control Reform Act of 2018 (ECRA) and other regulatory developments like Entity List designations have introduced some new difficulties for Chinese companies developing technologies at US research centers. In response, companies like Huawei and CloudMinds have scaled down their US operations while continuing to invest in global R&D operations elsewhere. Companies like Didi have diversified by opening research centers in other jurisdictions instead of expanding their existing US footprints. And other firms like satellite imaging and software services provider Twenty First Century Aerospace Technology have avoided the United States altogether and instead established R&D bases elsewhere in North America and Europe over the last few years.

## 5. How do you assess the impact of current U.S. restrictions on investment in Chinese companies listed on the Mainland?

Beyond a few modest headaches such as forcing China's leading mobile telecommunications companies to delist from US stock exchanges, US policies prohibiting investment in certain Chinese companies have so far had only minimal tangible impacts on Chinese firms' business prospects and operations. The United States has simply been unable to meaningfully starve Chinese companies of development capital through the use of investment bans involving only its own citizens and stock exchanges. This reality reflects the globalized and highly mobile natures of modern international financial investment: alternatives abound. Although many companies still prefer to list in the United States, today Chinese technology firms can also raise capital in Hong Kong, on tech-focused exchanges in mainland China, or in a number of other international venues. And while the United States is a major global supplier of portfolio investment capital, there are plenty of other domestic and foreign substitutes to buy up US positions if US investors are forced to withdraw. Given these dynamics, it is not surprising that impacts on US investors have appeared to be more significant in some cases than on the underlying targeted Chinese firms as a result of these policies so far.<sup>18</sup>

A straightforward way to measure the relative impacts of different targeted policy tools on the operations of Chinese companies is to observe stock prices of publicly traded firms impacted by these exogenous US policy shocks. In the case of US investment bans on Chinese companies with military links,

---

<sup>17</sup> National Security Commission on Artificial Intelligence, *Final Report*, March 2021, available at: <https://www.nscai.gov/wp-content/uploads/2021/03/Full-Report-Digital-1.pdf>.

<sup>18</sup> Alexander Osipovich and Chong Koh Ping, "Trump's Ban on Chinese Stocks Roils Investors", Wall Street Journal, 10 January 2021, available at: <https://www.wsj.com/articles/trumps-ban-on-chinese-stocks-roils-investors-11610274600>.



few targeted companies have seen their stock prices massively impacted as a result of US policy action, indicating minimal financial stresses or other negative outcomes for those firms. For example, at the end of February, the Hong Kong shares of China Mobile traded more than 7% above their November 11 closing price (the day before the Trump administration first announced the investment bans), despite enduring a delisting from US exchanges in January. The Hang Seng index was up about 12% over the same period, indicating only a slight underperformance for China Mobile. Compare this to the performance of ZTE: the Chinese firm's Hong Kong-listed shares fell more than 30% in the weeks after it was added to the Entity List in March 2016, while the broader Hang Seng market traded mostly flat. Cutoff from critical US technology inputs was clearly more impactful for ZTE's business than a US delisting and investment ban were for China Mobile's.

### 5.1 What could the United States do differently to target investment that could potentially benefit Chinese defense firms or otherwise fund companies acting contrary to U.S. national security interests?

Where US and other foreign investment in Chinese technology firms consists only of fungible capital, the main determinant of the efficacy of any investment ban is the extent that targeted Chinese companies can raise replacement capital from other sources. Only if a firm is effectively starved of capital can an investment ban have major impacts on a company's business. However, effecting capital starvation within our deeply interconnected and globalized financial system is extremely difficult, even if the United States is able to coordinate with like-minded allies on investment restrictions. There are enough alternative sources of capital from both private and government sources in China as well as from investors in other jurisdictions who are unlikely to agree to US-led investment prohibitions so as to make a widespread capital starvation strategy practically untenable.

This is not to say there is no space for regulating US capital investment in Chinese companies on principle; like many others in the United States, I feel that there is something perverse about investing in Chinese firms that are acting contrary to US interests and values, especially when those behaviors constitute those companies' whole raison d'etre. However, recognizing that capital starvation is rarely an achievable outcome, US policymakers should carefully weigh the potential economic costs they are likely to impose on US investors on a case-by-case basis and know that they are unlikely to meaningfully affect target Chinese firms' business prospects through this channel alone. Moreover, in some cases US investment bans may also have unintended negative consequences, for example by encouraging the Chinese government to forge stronger direct ownership ties with strategic companies as US and other foreign investors withdraw, pushing those Chinese companies closer to the embrace of the state.

The United States and its allies may be better served focusing on regulating scenarios where US and other foreign players offer more than just fungible capital to Chinese firms. In cases where investors contribute proprietary technical knowhow, valuable networking ties, or other forms of differentiated support to Chinese investment targets acting contrary to US interests, regulatory intervention is much more likely to have tangible impacts on those Chinese companies' businesses. For example, in cases where existing tools like the US export controls regime fall short, the United States might regulate the types of non-financial contributions US investors can offer to their Chinese investment targets, possibly differentiating based on Chinese firms' ties to the Chinese state, presence in critical technology areas, or other relevant criteria. This would necessitate a government-led effort to first understand the scope of potential harm to US interests stemming from unregulated foreign investment in Chinese technology

companies, including a careful study of historical patterns, technologies, linkages, applications, and so on.

6. The Commission is mandated to make policy recommendations to Congress based on its hearings and other research. What recommendations for legislative action would you make based on the topic of your testimony?

I want to begin by emphasizing the need there is for government to lead out on crafting solutions to challenges presented by China's state-led, market-oriented overseas technology acquisition strategy. Free markets cannot address these challenges effectively on their own because China is using its influence to alter domestic and foreign economic actors' incentives within free markets to foster its own desired outcomes at the expense of US and other foreign interests. Absent any policy response, the United States' default option is to continue to allow its own citizens and corporations to be led by the economic incentives China has crafted through state intervention in global markets. These incentives typically offer US economic actors short-term rewards at the expense of long-term sustainability and the broader economic and strategic interests of the United States. Addressing Chinese overseas technology acquisition efforts involves a textbook case of mispriced externalities: US economic actors are not fully internalizing the costs of their behaviors vis-à-vis China because they do not have to directly bear those costs.

Government can fill this leadership role in three important ways:

(1) **Bring transparency and awareness to China's overseas economic statecraft ambitions and strategies.** Government can help private market participants better price the risks of engaging with China across various economic conduits by tracking, understanding, and educating on China's evolving efforts to acquire foreign technologies and expertise. Even today, there remains a worrying lack of understanding among many US research institutions, multinational corporations, financial investors, and others about the scope and purpose of China's global technology acquisition strategy.

The following are practical steps US government may consider in pursuit of this goal:

- **Form a government body in charge of understanding and monitoring China's technology acquisition efforts.** Government should consider forming a centralized body tasked with monitoring the latest developments in Chinese technology acquisition policy and strategy on behalf of all US public and private stakeholders. As much as practically possible, this body should have access to the insights and knowledge generated and held within all arms of the federal government, including law enforcement and defense segments, to maximize knowledge sharing and efficacy. This body should release regular public reporting with appropriate details to provide stakeholders with timely, accurate information on the latest potential risks and costs of enabling Chinese technology acquisition efforts.
- **Provide the tools for government to collect information:** Understanding and educating on China's technology acquisition activities requires that government be able to systematically assess channels and cases of Chinese technology transfer efforts. This in turn requires government to have good information on the activities of US and other foreign economic actors engaging with China. Currently there are many areas where a lack of data makes this difficult. For example, US private equity investors often do not disclose their funders or Chinese

investment targets, preventing government from understanding how their behaviors may be harmful to US interests (it is notable that China requires considerably more disclosure among its corporate investors than the United States does). Also, US firms often choose not to disclose cases of Chinese technology transfer they are involved in, even when disclosure could help inform others in the United States about important risks or developments. The US government should systematically identify areas like these where a lack of information is a major hurdle and craft policy to enable government to acquire needed datapoints.

- **Give government the authority to proactively warn private market players of specific risks:** Current well-meaning regulations like those prohibiting US intelligence agencies from disclosing actionable information to specific private sector participants without sharing that same intel with a firm's competitors have unintentionally made it difficult for government to alert US companies and other organizations to specific China-related technology acquisition threats. The US government should consider changes to these regulations to allow it the needed latitude to fully share valuable information with private market players to counter imminent technology transfer risks. Poor communication among government and private market stakeholders creates preventable opportunities for China to effect harmful technology acquisitions.

(2) **Counter the distorted economic incentives China has introduced into international markets with appropriate policy.** Understanding and informing private market actors about China's technology acquisition strategies will not be enough alone – absent any regulatory or economic consequences, US and other foreign players will still make decisions that harm long-term US interests in exchange for short-term economic gains. As it contemplates policy and regulatory solutions, the US government should prioritize its efforts based on China's evolving strategies and observed real world behaviors and should pursue steps that are targeted and precise instead of blunt and unnecessarily self-harming. This is not to say that the scope of any solution will be small; the threat China poses to US interests through its technology acquisition programs is measured in the trillions of dollars in terms of both resources committed by China and potential costs to the United States.

The following are practical steps US government may consider in pursuit of this goal:

- **Implement needed policy fixes to counter risks tied to US investment in China:** As part of its efforts to create transparency and understanding around China's strategies for acquiring foreign technologies, the US government should determine what kinds of US investments in Chinese technology and other companies entail legitimate, unmitigated risks to US interests. The US should then work (ideally with allies) to craft targeted policies that guide investors from the United States and elsewhere away from investment activities in China that unacceptably strengthen Chinese strategic capabilities or entail other unacceptable compromises to US principles and values. Policymakers should understand that in most cases, capital starvation and significantly altering Chinese company behaviors will not be likely outcomes of any policies restricting investment in Chinese startups or other companies.
- **Proactively identify and engage in other areas where policy attention is needed:** China's multifaceted technology acquisition strategy involves numerous conduits of technical transfer, many of which are more potent than US investment in Chinese technology startups. The US government needs to systematically identify these conduits and determine whether there is need for policy intervention in each case. For example, while US lawmakers have given significant attention to investment screening and export controls in recent years, other non-

equity conduits such as R&D partnerships and talent recruitment programs have not been scrutinized as closely with an eye towards actionable policy solutions.

There is also need for continued attention in areas where US lawmakers have recently implemented policy changes. For example, although passage of the Foreign Investment Risk Review Modernization Act (FIRRMA) in 2018 created new authorities for the Committee on Foreign Investment in the United States (CFIUS) to review foreign venture capital investments and resulted in a notable drop in Chinese industrial policy and other state-affiliated venture investments in the United States, a lack of public enforcement actions since then and a growing perception that skirting new rules has limited repercussions has resulted in a rebound in Chinese state-affiliated investment in the US startups space. Unless FIRRMA enforcement in the venture capital space becomes timelier and more systematic (and also more public, to the extent that is possible given confidentiality requirements), this dynamic is unlikely to reverse.

- (3) **Adopt policies to promote innovation and keep the United States the world's leading technological power.** The United States owes its current position at the pinnacle of the global technology ladder to a social and economic environment that has been highly conducive to innovation over many decades. As the United States considers policy responses to China's efforts to acquire foreign technological expertise, we should remember that no amount of preventative action to keep technology transfer at bay can maintain the United States at the forefront of the global technological frontier if the United States loses its position as the most attractive destination for innovators from around the world. An ample body of academic literature exists illuminating the kinds of support needed to maintain a competitive innovation ecosystem, from public funding and tax credits to building human capital through progressive immigration rules and a focus on STEM educational capacities.<sup>19</sup> China is competing with the United States to become a center of global innovation, and the United States must outcompete in these realms if it is to maintain its long-term technological edge.

Inclusivity towards foreigners has long been a critical element of the strong innovation environment in the United States. In that light, I find the recent direction US immigration policy has taken to be particularly concerning. We must keep the United States a welcoming place for global entrepreneurial talent, including from China, in order to maintain the United States' competitive global edge in innovation. US-trained Chinese entrepreneurs and engineers have played a more important role in the recent development of China's technology capabilities than funding from US venture investors has. By fostering anti-Chinese sentiment in the United States through policy and rhetoric, our leaders have risked cementing a more alienating environment that has already encouraged hundreds of thousands of Chinese innovators to go home instead of applying their talents in the United States. I encourage policymakers to carefully consider how the United States can use immigration policies in narrow, targeted ways to prevent harmful knowledge transfers while strongly signaling our commitment to remain an open society where innovators from any nation are welcome to participate and prosper in our vibrant ecosystem.

---

<sup>19</sup> For example, see: Bloom, Nicholas, John Van Reenen, and Heidi Williams, *A Toolkit of Policies to Promote Innovation*, *Journal of Economic Perspectives*, Vol. 33, No. 3, Summer 2019, (pp. 163-84), available at: <https://www.aeaweb.org/articles?id=10.1257/jep.33.3.163>.