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China's experience in building a venture capital sector: Four lessons for policy makers

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CIGI Papers No. 248 – January 2021

China's Experience in Building a Venture Capital Sector

Four Lessons for Policy Makers

Anton Malkin



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About the Author

Anton Malkin is a CIGI fellow and assistant professor in the Department of Global Studies at the Chinese University of Hong Kong, Shenzhen. His research looks at China's role in the global economy, with a focus on finance and intellectual property. In his prior role as research fellow at CIGI, Anton published works on the impact of China's industrial upgrading policies on global trade governance, the domestic politics of capital account liberalization in China, and China's relationship with the International Monetary Fund and regional financial governance arrangements. Anton's current research examines the impact of China's industrial policies on Chinese multinational firms' acquisition of foreign-owned technology assets and China's financing of emerging technologies through venture capital.

From 2012 to 2013, Anton was a senior visiting scholar at the School of International Studies at Peking University. His Ph.D. thesis examined the role of foreign financial institutions in the transformation of China's financial markets and state-owned enterprises.

Acronyms and Abbreviations

AI	artificial intelligence
ARDC	American Research and Development Corporation
CCP	Chinese Communist Party
COVID-19	coronavirus disease 2019
FDI	foreign direct investment
GBFs	government-backed funds
GGFs	government guidance funds
ICT	information and communications technology
IDG	International Data Group
IP	intellectual property
IPO	initial public offering
IPRs	intellectual property rights
LP	legal partner
M&As	mergers and acquisitions
NDRC	National Development and Reform Commission
PE	private equity
R&D	research and development
SCGC	Shenzhen Capital Group Company
SMEs	small and medium-sized enterprises
SOE	state-owned enterprise
VC	venture capital

Executive Summary

This paper examines the history of China's venture capital (VC) sector from the late 1980s to the present day and draws lessons on its decades-long experimentation with creating financing channels for early-stage technology business growth. The author highlights four broad takeaways from the myriad of policies that China's policy makers have employed. These include the importance of labour market policies that encourage reverse migration of highly educated and experienced expatriates; the observations that weak intellectual property (IP) protection may not necessarily scare potential VC funds away, especially in developing countries; that government finance, when channelled appropriately and combined with selective deregulation and financial incentives, can play a positive role in helping channel capital toward promising technology firms; and, lastly, that open and liquid domestic capital markets are neither sufficient nor necessary for the formation of a vibrant VC sector.

Introduction

In the past decade, China's impressive technological strides have been difficult to miss, even for the most casual observers. As articulated in Kai-Fu Lee's now popular book *AI Superpowers: China, Silicon Valley, and the New World Order* (Lee 2018, 24), China's journey from being a technological backwater to a country increasingly known for producing technological leaders and Fortune 500 companies seems to have taken place at breakneck speed. As if seemingly overnight, China's information and communications technology (ICT) industry produced record numbers of "unicorns"¹ (BBC News 2019) and created an internet sector to rival its American cousin in Silicon Valley.

As many policy makers around the world — in developing and developed countries alike — struggle to create viable channels to fund and nurture innovation, it is appropriate to ask what, if anything, can be learned from China's experience

in this area. It is notable that what distinguishes China's experience from that of most other countries is not the presence of tech giants, as many countries have advanced, globally competitive technology firms, but the presence of an active and globalized VC sector that is able to help start-ups scale their technologies and other innovations.

This paper offers a discussion of the conditions that have led to the growth of China's VC market into the second biggest in the world, after that of the United States. The purpose of this paper is neither to offer a novel empirical case study of China's VC markets nor to offer a definitive explanation of how and why China has developed a large and sophisticated system for financing technological growth and helping small and medium-sized enterprises (SMEs) to scale their business models and technologies. Rather, this paper seeks to underline the lessons that policy makers can learn from China's experience with financing technological development. China's experience is puzzling for various reasons, as the institutional and market conditions were not clearly conducive to the growth of private sector technology financing channels. Chief among these conditions are the following:

- China's financial system is heavily state-permeated, with market-oriented and sociopolitical goals heavily intertwined.
- IP protection was notably weak in the formative years of the VC industry.
- Investor protections and business contract enforcement were initially weak or non-existent.
- China limited the flow of capital across its borders.
- China was not at the technological frontier.
- China has struggled with, and continues to struggle with, financing SMEs.

What lessons, if any, can policy makers and other countries draw from the emergence of China's VC sector in the face of these obstacles?

Four conclusions are drawn from surveying China's experience with encouraging the formation of a VC sector: a reliance on labour market policies encourages reverse migration of highly educated and experienced expatriates; weak IP protection may not necessarily scare potential VC funds away,

¹ A unicorn is a privately held, rapidly growing, early-stage technology company valued at \$1 billion or more. All dollar figures are in US dollars.

especially in developing countries; government finance, when channelled appropriately, and combined with selective deregulation and financial incentives, can play a positive role in helping channel capital toward promising technology firms; and, lastly, an emerging market does not need to achieve financial maturity before exploring ways of creating sophisticated funding channels for technology ventures and entrepreneurship.

A Stylized History of VC in China

In the first quarter of 2018, the size of China's VC financing surpassed that of the United States, attracting 47 percent of the world's VC funds, with Canada and the United States combined attracting only 35 percent (Yang 2018). As of 2019, China has surpassed the United States in the production of unicorn firms. According to the Hurun Research Institute (Hurun 2019), China boasts more unicorns than the United States (see Table 1) and is home to more unicorn-producing cities than its American counterpart (see Table 2). While the growth rate of China's VC fundraising has slowed down (Prequin 2019) — driven, in part, by financial regulators' deleveraging efforts, China's slowing economic growth rate, the US-China trade and tech war, and investor concern over high valuations among Chinese tech start-ups — the country has nonetheless gained the distinction of being the world's second-largest VC market by funds under management (He 2019).

It should be noted, however, that the structure and culture of VC funding in China and the United States differ in some fundamental ways. Naturally, Silicon Valley is focused on the familiar processes of "creative destruction," using technology to replace existing business models and industry structures. In China, by contrast, novel technologies are adopted to promote economic catch-up and feed off positive externalities created by the country's rapid urbanization and economic development more broadly. Perhaps as a result, market-leading ICT firms provide a significant share of VC funding and develop many start-up firms with VC funds in-house. Looking at China's unicorn output, it is clear that China's VC sector

Table 1: Country Ranking by Number of Unicorns

Ranking	Country	Number of Unicorns
1	China	206
2	United States	203
3	India	21
4	United Kingdom	13
5	Germany	7
6	Israel	7

Source: Hurun (2019).

Table 2: City Ranking by Number of Unicorns

Ranking	City	Number of Unicorns
1	Beijing	82
2	San Francisco	55
3	Shanghai	47
4	New York	25
5	Hangzhou	19
6	Shenzhen	18

Source: Hurun (2019).

creates more value from large corporate spinoffs than this sector in the United States. Indeed, out of China's 206 unicorns, 153 have emerged as spinoff firms from Alibaba alone, followed by 54 from Ping An and 22 from JD (Hurun 2019). Box 1 illustrates how this idiosyncratic market structure has not been uncontroversial in China, recently attracting a strong rebuke from regulators.

As Figure 1 shows, while the scale of increase in funding fluctuated since significantly taking off in 2009, it has nonetheless seen a steady upward trajectory in spite of various cycles of retreat in private sector growth, such as following China's state-funded stimulus packages in 2009 and the deleveraging campaign that began in 2015. In 2020, Chinese VC funding did, in fact, experience a steep contraction, driven at least in part by the impact of the coronavirus disease 2019 (COVID-19) on the entire economy, but saw a significant rebound, in particular in the biotech and pharmaceutical industries (Ruehl and McMorro 2020). How has

Box 1: Alibaba, Financial Stability and the Future of Chinese VC

Despite its foundational roots in Silicon Valley and other foreign markets, China's VC sector has evolved to take on a distinct structure. In particular, some of the first VC success stories have become not only some of China's biggest ICT firms but also its largest sources of VC funding. One notable example is Alibaba and its fintech offshoot, Ant Financial. The latter emerged in 2010 as a spinoff from its parent Alibaba, which encountered regulatory difficulties in starting a fintech business due to foreign ownership limitations in China's financial sector (Yahoo and SoftBank owned a large majority of Alibaba shares at the time). In 2019, Ant Financial attracted almost as much VC cash (\$14 billion) as all EU and US fintech firms combined (\$15.9 billion) (Detrixhe 2019).

Ant Financial was so successful in attracting investment attention that in late 2020, in the midst of the global COVID-19 health crisis, it was set to complete the largest ever initial public offering (IPO) in history, raising \$39.6 billion in a simultaneous listing in Hong Kong and Shanghai. On November 5, just two days before the firm would go public, regulators reversed their decision to permit the firm to list. Among regulators' chief concerns was a potential conflict between the firm's consumer lending practices and China's newly

introduced regulations to rein in the rapid expansion of the consumer finance industry.

Herein lies an important dilemma of China's VC sector. Its stellar growth was premised on worldwide excitement about the future of China's fintech sector, underpinned by the growth of the country's middle class, its urbanization and its increasing sophistication in ICT. However, the regulators' decision seems to suggest that financial stability is a paramount concern for China's leaders and that the prospect of Ant Financial competing directly with China's banking institutions — a notion that Ant Financial's CEO Jack Ma echoed in a fiery speech just before the IPO was pulled (Xu 2020) — is no longer a sure bet for investors.

While the rapid expansion of VC funding opportunities has proven to be very conducive to China's financial maturation and technological catch-up, the financial risks involved in such a rapid expansion of non-bank financing channels and in the proliferation of large oligopolistic corporate conglomerates that they helped fund are not limitless in their possibilities. While VC funding is dwarfed by commercial bank funding, pension funds, hedge funds and other large institutional channels such as exchange-traded funds and mutual funds, the industry is not necessarily without risks.

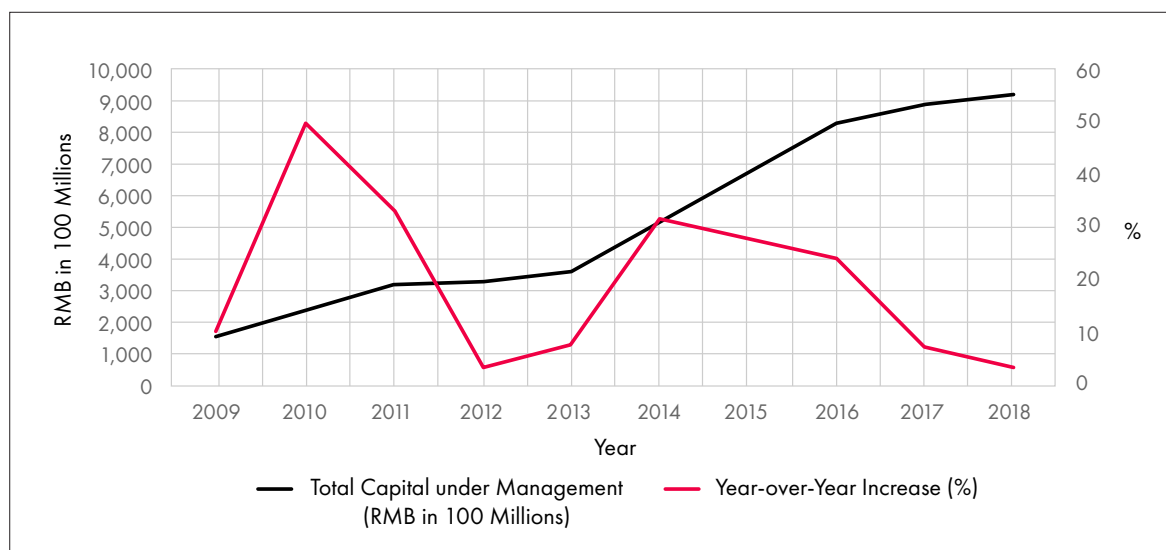
this sector been able to attract such considerable growth despite considerable institutional obstacles?

While China's VC surge began to capture global headlines only in the past half-decade, the history of this part of China's financial industry is nearly three decades old. Much like its US counterpart, China's VC industry predates the rise of the country's ICT industry. The American VC industry was born of cumulative government of a private financier effort to provide early-stage capital for the burgeoning semiconductor and personal computer industry. By offering more than financial capital, pioneer VC firms such as the American Research and Development Corporation (ARDC; see case study in Nicholas 2016) also actively involved themselves in the management of young

firms, and where the commercial utility of the technological product was not yet proven.

The early days in the history of China's VC industry saw firms emerge in a vastly different environment. However, one feature in 1990s China bore important similarity to that of the United States in the late 1940s: latent technological capability with no access to start-up capital. Much like the ARDC in the postwar United States, the International Data Group (IDG), an American business and information technology data service firm, recognized a business opportunity in a dearth of funding for technology development in a country that had only recently set up equity markets and commercial banks. In 1992, the IDG established a joint venture with the state-owned Shanghai Science and Technology Commission,

Figure 1: China's Total VC Funding (2009–2018)



Data source: Ministry of Science and Technology (2018).

building on the government's efforts in the 1980s, wherein state-owned technology financing firms were set up to channel funds into preferred state-owned technology firms (see Nicholas 2016).

While the 1980s did not create anything resembling a modern VC sector, it did produce an important piece of infrastructure that would later feed into the development of the Chinese ICT industry. By introducing the Torch Program, China began to allow local governments and institutions such as universities to pilot business technology incubators in 1988, which led to the establishment of what came to be known as science and technology industrial parks. With Deng Xiaoping's pivotal tour in early 1992 revitalizing China's leaders' commitment to economic liberalization, space for SMEs, and for private enterprise more specifically, was firmly established in China's political economy — albeit not yet formally enshrined into law.²

The IDG was an early foreign investor betting on technological development in China and followed up its initial joint venture with several more funds aimed at providing financing channels for US firms to develop software in China

(Mullich 1993). By 1996, the IDG had offices in Shanghai, Guangzhou and Tianjin and \$80 million in VC funds under management (Li 1996). By 1998, after a half-decade of experimentation with VC funding, including an unsuccessful launch of China's first domestically funded VC firm, the China New Technology Start-up Investment Company, China's VC experiment stood at a crossroads. While private firms proliferated, there were few incentives for VC money to be invested, as exit options were limited. Stock markets in Shanghai and Shenzhen largely precluded the listing of private firms, and most shares listed were non-tradable state-owned enterprise (SOE) equity. However, 1998 marked the passage of two important events: the Ninth National People's Congress (China's national legislative body) endorsed a proposal to encourage the proliferation of VC funds. This allowed foreign firms to forgo direct cooperation with government agencies and, perhaps more importantly, saw the successful incorporation and listing of a Chinese SOE in the stock exchanges of Hong Kong and New York.

Despite a lack of "exit channels" — opportunities for VC investors to recoup their initial investment and, hopefully, earn a return through means such as private equity (PE) placement and IPOs in stock exchanges — the late 1990s were a pivotal period in China's financial history and offered an unlikely solution to the problem. China's experimentation with SOE reform since the early 1980s saw Chinese state entities raising capital through informal

2 Formal protection of private enterprises in China's political system would only come to pass in July 2001, when President Jiang Zemin proclaimed private entrepreneurs as a legitimate institutional entity under the purview of the Chinese Communist Party (CCP). In his prominent "Three Represents" speech, he placed SMEs and other private firms under the banner of "productive forces" that the CCP represents and effectively allowed them to join the party. The concept was ratified in the Sixteenth Party Congress in 2002 (see Dickson 2003).

channels in Hong Kong. Among these channels were financial innovations spearheaded by Hong Kong brokerage firms that allowed Chinese state entities to offer limited ownership shares outside of Hong Kong's main stock exchange, which came to be called "red chip stocks."³ By the early 1990s, this bottom-up experiment caught the attention not only of Hong Kong and mainland Chinese authorities but of Wall Street as well.

Following the successful simultaneous listing of China Mobile on the Hong Kong and New York stock exchanges in 1997 — after years of negotiations between Goldman Sachs, led later by US Treasury Secretary Hank Paulson and the China Construction Bank, and subsequently led by State Council Standing Committee member Wang Qishan — political as well as market space was open for the listing of Chinese SOEs and private firms abroad (Lombardi and Malkin 2017).⁴ Officially termed "H-shares," to distinguish them from mainland-based domestic-currency-denominated A-shares and foreign-currency-denominated B-shares (ibid.), the proof of concept of the foreign listing helped to galvanize foreign venture capitalists to invest in budding Chinese ICT firms. In the coming years, prominent VC investors such as Sequoia Capital and SoftBank would help early-stage Chinese tech firms catch up with, and later compete with, their Silicon Valley rivals. Table 3 outlines the timeline of Chinese firms' experience with raising capital abroad. As Malkin and Li (2019) argue, China's regulators have always been willing to encourage capital inflows and reluctant to allow outflows.

This trend may have also inadvertently contributed to the rise of VC and PE funding in China, as foreign firms' revenues could not be easily repatriated back to their headquarters, and avenues for financial investment were, and continue to be, rather limited. As will be discussed in further detail in

the final section of this paper, China's idiosyncratic mix of capital controls and financial repression created opportunities for VC funding channels.

The year 1998 saw another significant development in China's regulatory history that allowed VC firms to channel funds toward China's then-budding internet sector. In the First Session of the Ninth Chinese People's Political Consultative Conference in 1998, authorities endorsed the dryly named "proposal no. 1," which sought to create a special equity board for private technology enterprises and eased regulatory barriers around VC and PE investing. While creation of the board was delayed until 2009, the political signal from authorities was received, and foreign VC funds began to proliferate in mainland China. The following year, newly formed internet firm SINA received a \$250-million investment from several foreign VC funds, and Alibaba notably received a \$200-million investment from SoftBank in 2000.

In 1999, state-owned Shenzhen Capital Group Company (SCGC) was established with a capital commitment of 500 million RMB. It served as a departure from the various state-owned technology funding mechanisms that had existed since the 1980s by focusing on commercially viable technology and a revenue-based management structure. The fund worked with foreign, private and government-owned investors to manage different funds that would invest in SME growth in China's coastal manufacturing hubs, with the goal of tapping into the strong growth in small and medium-sized manufacturing enterprises that the region had seen since the early 1990s. The fund ushered in a significant normative shift in policy makers' approach to government-backed funds (GBFs). Unlike in the 1980s and 1990s, policy makers' approach to government fund management focused much more intently on commercialization and SME support, representing a shift in the Chinese government's consensus on the role of markets and private enterprises in China's economy. As Li Wanshou, the company's then president and co-founder put it, "For governments that wanted to develop the local economy and local enterprises, the GBF enabled them to leverage external capital and professional expertise and reduced their risk exposure. For local enterprises, the GBF not only became an important, long-term financing channel during their expansion but also provided more comprehensive value-added services compared to a government subsidy. For

3 Red chip stocks were listed equity shares of SOEs in Hong Kong. In the 1990s, China's state-owned firms operated by a different set of managerial, accounting and other institutional corporate practices than other global firms, so regulatory exceptions had to be created to allow them to raise capital in Hong Kong. The red chip moniker signalled to investors that these were not traditional corporate entities, and carried with them risks and opportunities specific to the emerging mainland Chinese market. At first, red chip stocks were not listed on Hong Kong's main exchanges and were only sold by smaller brokerages.

4 Listing in New York was, at the time, a bigger deal than listing in Hong Kong, and involved deeply rooted collaboration between Chinese policy makers and Wall Street banks to legitimize the listing of SOEs there. See Malkin (2016) for a detailed discussion.

Table 3: Stylized Timeline of IPO Trends in China

Period	Event	Significance
1980–1991	Red chips proliferate	Chinese SOEs access global capital
1991–1997	H-shares instituted	Informal capital inflows formalized
1997–2008	SOEs rush to list abroad	China’s state sector finds a lifeline
2008–2016	Private firms list abroad	Private sector innovation accelerates
2016–Present	Private firms and SOEs return home	Self-reliance, trade and tech wars take hold

Source: Author.

SCGC and local investors, they benefited from the local governments’ strong support in deal sourcing, deal execution, and exiting” (Gompers et al. 2010, 6).

In the mid-2000s, additional significant regulatory and institutional changes took shape. First, in 2005, the National Development and Reform Commission (NDRC) passed the Interim Measures for the Management of Venture Capital Enterprises, which gave more freedom to both domestic and foreign VC funds to raise funds and utilize them for fund management activities. That same year, authorities also passed the non-tradable share reform in China’s equities markets, allowing more market-determined pricing mechanisms in the Shanghai and Shenzhen stock exchanges. In 2006, the State Council passed the Partnership Law, which made it easier for foreign VC to enter China and to set up joint ventures for the purposes of VC and PE activities. Perhaps more importantly, in 2009, China set up the ChiNext Board, which allowed SMEs to list shares under much less stringent profitability and business history requirements than were characteristic of China’s existing exchanges (Huang and Tian 2019).

In the following years, Chinese authorities also eased regulations on institutional investors (including commercial banks and insurance companies), government funds and foreign investors’ ability to make equity investments in private firms. Foreign firms, long restricted from investing in Chinese financial markets vis-à-vis China’s famously stringent capital controls regime, were encouraged through various tax and other regulatory incentives to raise funds in China and abroad for the purpose of financing Chinese SMEs. The Eleventh Five-Year Plan in 2006 saw policy makers’ first endorsement of entrepreneurship as a major source of growth for the Chinese economy going forward. Following on the heels of the

Qualified Foreign Institutional Investor program that allocated capital quotas for foreign financial institutions to invest in China’s equity markets, various municipalities, including Shanghai and Beijing, launched the Qualified Foreign Limited Partnership pilot schemes, which further eased the regulatory burden for mainland funds to raise capital from overseas-based financial institutions looking to invest in China’s VC and PE industry.

Briefly interrupted by the credit crunch resulting from the global financial crisis in 2008–2009, as well as by China’s two-year (2012–2014) hiatus on domestic IPOs (see Malkin and Li 2019), the easing of regulations on VC fundraising and investment led to the exponential growth of VC funds flowing to technology-oriented SMEs in China. By 2018, the total dollar volume of China’s VC deals surpassed that of the United States (Rowley 2018). However, the Chinese VC system today is not a carbon copy of its US counterpart. While the US VC model emerged largely without long-term planning or funding by government authorities (Gilson 2003), the Chinese model saw and continues to see the involvement of state capital, albeit less so (since the 1990s) in a managerial and allocative capacity. Today, successful state-backed funds such as the SCGC continue to function but are few and far between. The state has resorted to taking a “leading” or “guiding” function in China’s VC ecosystem, providing something akin to moral suasion or forward guidance practised by central banks in advanced economies. Moreover, much of China’s state-owned fund energy has moved away from competing with market-oriented investors and has homed in on sectors that the central government considers important for national security and socio-economic development — sectors such as semiconductors, artificial intelligence (AI) and electric vehicles (see Malkin 2018; 2020).

As with the idiosyncratic and historically contingent US example of VC formation (Gilson 2003), there are aspects of the Chinese model that cannot be replicated elsewhere. The latter are products of the contextual history of economic liberalization and development in China since 1978. However, China's experience does provide important lessons for advanced and developing economies alike in fostering the growth of a viable VC sector. The rest of this paper explores these lessons in some detail. It should be noted that the following discussion is not based on definitive findings about what policy makers should keep in mind when drawing on the Chinese example of VC market development. This is neither a large-*n* quantitative study of VC market data nor a comparative case study on the Chinese VC ecosystem, juxtaposed with comparable economies. Rather, the goals of this paper are to highlight some less recognized, and perhaps counterintuitive, aspects about China's historical experience with VC development that are not typically appreciated by policy makers.

What Can Be Learned from China's Experience?

Lesson 1: While Financial Capital Is Crucial, Human Capital Is Equally Important

Capital is the operative word in VC. Naturally, the literature and public discussion about optimal policy for promoting VC formation tends to focus on encouraging the flow of financial capital toward the risky and fraught world of financing entrepreneurship and technology more generally. But these discussions, important as they are, tend to miss the importance of another type of capital — human capital. Several studies have emphasized the importance of “returnee entrepreneurs” to China's remarkable strides in economic development and technological catch-up (see, for example, Liu et al. 2009; Ma and Pan 2015).

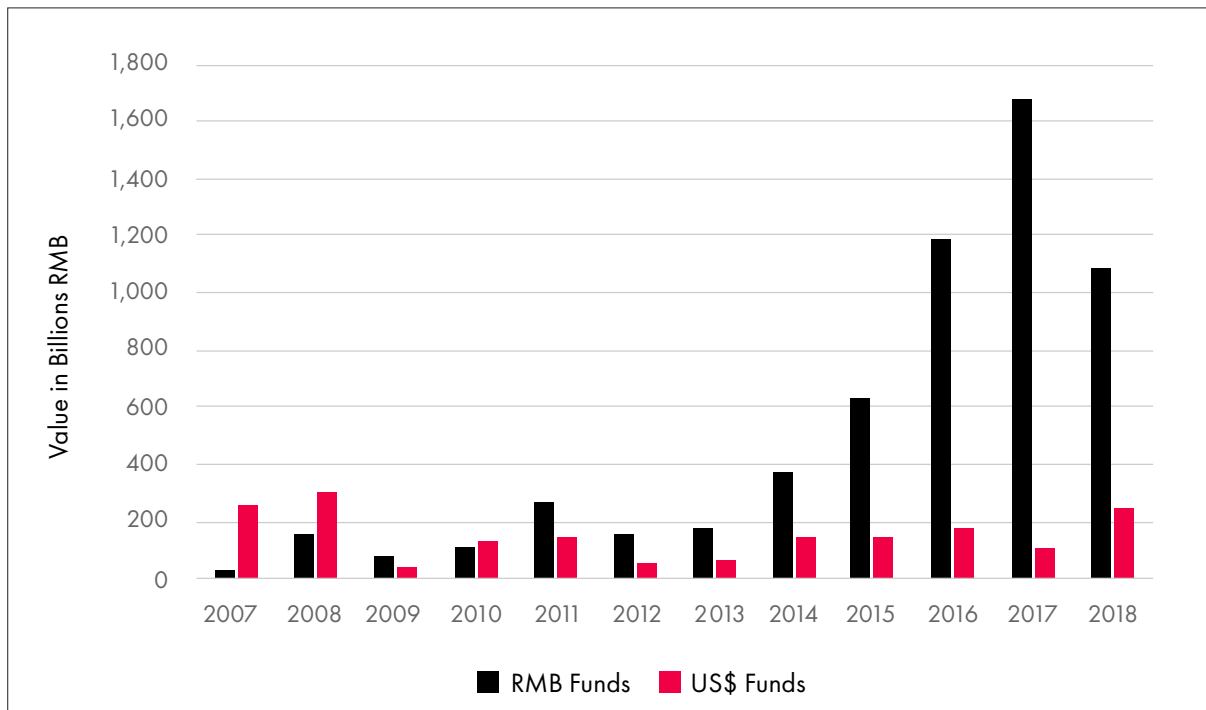
In practical terms, the missing key to unlocking the puzzle of VC growth in China could be called returnee labour policy. Since the start of reform and opening-up policies in 1978, China has

been actively encouraging its students to study abroad. Many of these students had subsequently stayed abroad and pursued careers in science, engineering and finance. Beginning in the 1990s, many of these emigrants saw opportunities to return, not least because of policy makers' policies aimed at attracting returnee talent, such as tax breaks, grants and loans vis-à-vis science and technology incubator funds and technology parks (Ma and Pan 2015; Fuller 2005; Breznitz and Murphree 2011). These reverse migrants, known colloquially as *hai gui* (sea turtles), have played an important part in China's catch-up efforts in sectors ranging from banking to engineering and, of course, VC (Wang, Zweig and Lin 2011).

As Figure 2 shows, until VC funding took off in 2014, foreign funds provided the foundation for the VC sector to grow. Therefore, while today RMB funds comprise the vast majority of total venture funds under management, the expertise and capital were originally provided by foreign VC funds, which were typically brought to China by returnee venture capitalists. Indeed, over the past decade, the returnees had themselves begun to utilize domestic funding far more than US-dollar funds (*The Economist* 2020). Perhaps due to China's consistent policy bias in favour of encouraging capital inflows and discouraging outflows (Malkin and Li 2019), the presence of foreign-incorporated funds has always significantly lagged domestic-incorporated funds, be they US-dollar or renminbi funds (*The Economist* 2020). And while foreign VC backing consistently increased the chances of domestic Chinese firms listing in overseas stock exchanges — the most reliable way of earning US-dollar returns in foreign venture capitalists' home markets (Humphrey-Jenner and Suchard 2013) — the lack of clear channels to repatriate earnings from mainland China has incentivized foreign venture capitalists and returnee capitalists to set up domestically oriented operations. Not surprisingly, as regulations on VC funds loosened and the transparency and predictability of the domestic VC/PE market environment grew (Lin 2017), much of the uptick in VC funding led to the proliferation of renminbi rather than US-dollar funds.

It is therefore worth considering these actors' role in China's VC sector. With the internet boom of the late 1990s, much of this situation changed. While the IDG — notably *not* a returnee-led VC fund — laid the foundations for the VC sector in China in the early 1990s, by the time US-based technology

Figure 2: Renminbi versus US-Dollar Funds



Data source: Zero2IPO (2020).

firm valuations burst with the dot-com bubble of the early 2000s, Chinese nationals who had left the country as students decades earlier found an opportunity to replicate the Silicon Valley model in Shenzhen, Beijing, Shanghai and other rapidly growing technology centres in China. Over the next decade, nearly all US-dollar-originating VC was started by returnees (Wang, Zweig and Lin 2011).

At the same time, while the role of returnees in the development of the VC sector in China has been shown to be a very important variable in bridging Silicon Valley and Wall Street cash with the needs of Chinese technology firms, it was necessarily a catalytic one. As Martin Kenney, Dan Breznitz and Michael Murphree (2013) have shown, returnees only became important once the policy foundations such as foreign direct investment (FDI) incentives, regulatory changes and technology transfers were laid — not only in the Chinese mainland but in Taiwan (Province of China) and India as well. Indeed, in China's case, some of China's earliest technological success stories — firms such as ZTE, Huawei and Founder — were, and continue to be, led by indigenous entrepreneurs, not returnees (ibid.).

It is also important to recognize that incentives alone were insufficient to attract large waves of talent into China's technology sector. Another simple factor drew educated and skilled entrepreneurs to return to mainland China: market opportunity. As IDG founder Patrick McGovern told the *South China Morning Post* in 2000, "The average annual return for venture capital funds in the United States is about 30 to 35 per cent but in China we expect the annual return on investment to be about 70 to 80 per cent" (Hui 2000). In other words, many expats returning to China may have done so irrespective of many available foreign talent incentive programs and have instead returned to pursue unique market opportunities.

Similarly, it was the flow of not only people but also ideas that aided the demand for VC in China. VC spread in China around the time that Anglo-Saxon financial intermediation models gained significant influence on financial regulation and practices in mainland China, from the East Asian financial crisis of 1997 until the global financial crisis of 2008 (Gruin 2019; Malkin 2016; Robertson 2015). This development allowed practices such as PE and VC to be more easily accepted by the CCP, which had, until the early 2000s, an uneasy relationship with

private capital. In other words, returnees chose an auspicious time to bring their VC model to China.

Nevertheless, the positive relationship between returnee policy and technological development is not unique to China and has been noted to be a contributing factor to the success of the American ICT sector (Wadhwa et al. 2008). China's experience, however, is noteworthy for developing economies with highly skilled expatriates studying and living abroad, such as India. Indeed, unlike the model of Silicon Valley, a migration-based process of technology and skill acquisition need not rely on the ambitious task of bringing the most highly qualified professionals and the latest technology with them. As several studies have shown, much of China's early wave of returnees brought skills and technology that were new to China but not necessarily bleeding edge or innovative (see Zweig, Chung and Vanhonacker 2006). As the next section will show, the VC industry caught up with its American counterpart, not only despite lacking the latest commercialized technology but perhaps because of it.

Lesson 2: Inadequate IP Protection Does Not Necessarily Hinder VC Formation

Existing literature on entrepreneurship and VC suggests a positive relationship between the strength of IP rights (IPRs) and VC formation (see Autio and Acs 2007; Mansfield 1994; Popov and Roosenboom 2013). At the same time, it has long been known that strong IPRs make SMEs liable to litigation from established market players (see, for example, Silverman 1990). Therefore, while venture capitalists may be attracted to firms where IPRs can be protected, strong IP protection could also backfire, even in developed markets. But, in the case of China, the expansion of the VC sector took place in a market with weak IPRs and significant barriers to entry, not only for technological SMEs — limited as they were by the Chinese government's very gradual recognition and support for small, private sector firms — but also for venture capitalists themselves, who, until the mid-2000s, typically needed to establish their operations in collaboration with state-owned industries. Recall that the IDG began its VC operations in collaboration with the Shanghai government.

To summarize, the recent literature on the relationship between the strength of a country's

IPRs and the willingness of venture capitalists to invest in SMEs would leave a casual observer to conclude, without having studied China's technological rise, that strong IP protection was an important factor in attracting VC — especially foreign VC — to invest in China's SMEs. However, the relationship between IP protection and VC funding is not necessarily linear. Strong IPRs can be conducive to attracting foreign capital (in the form of greenfield investment, technology and VC/PE), but it can also restrict competition and raise barriers to entry for domestic SMEs (Maskus 2000).

Such is the puzzle of VC growth in China: much of the available studies on the role of IP in VC formation do not offer a satisfying explanation for why the world's second-largest and most dynamic VC sector emerged in the midst of weak IP protection. However, there is some reason to suggest that a lack of IP protection did not hinder VC formation in the early days of venture funding in China.

Google executive Kai-Fu Lee (a sea turtle born in Taiwan) helped bring the world's predominant search engine to China in 2006. However, Lee soon left the firm — like many other returnee entrepreneurs — to support China's burgeoning domestic competitors to Silicon Valley. Lee, by his own account, felt that US firms were less adept at scaling technology in China and catering to China's market needs (Lee 2018, 24). One of the most notable characteristics of China's ICT market from the mid-2000s to the mid-2010s was its hypercompetitive nature and inability to take technological proprietorship for granted. Namely, the tried, tested and true model of using IPRs such as patents, trademarks and copyrights as a wall to provide a firm with room to operate at the behest of the competition would not arrive in China until the latter part of the 2010s. As Lee (ibid.) noted, “The battle royal for China's group-buying market was a microcosm of what China's internet ecosystem had become: a coliseum where hundreds of copycat gladiators fought to the death. Amid the chaos and bloodshed, the foreign first-movers often proved irrelevant. It was the domestic combatants who pushed each other to be faster, nimbler, leaner, and meaner. They aggressively copied each other's product innovations, cut prices to the bone, launched smear campaigns, forcibly deinstalled competing software, and even reported rival CEOs to the police.”

To paraphrase Saint Augustine, China's experience with the relationship between IP protection and VC formation could be described by the phrase, "Lord, grant me the will to protect and commercialize IP, but not yet." Indeed, as recent studies have noted (Prud'homme and Zhang 2019), China's record of protecting and commercializing IP has markedly improved over the past decade, and Chinese firms increasingly seek to extract commercial value from IP and to develop their own IP assets in-house through research and development (R&D), as well as through FDI, mergers and acquisitions (M&As), and direct IP purchases (Malkin 2018).

What changed? Lee credits the transformation to the exceptionally competitive nature of China's private sector. According to Lee (2018), as the Chinese copycat innovation model progressed, the only way to protect IP assets from hungry competitors, unencumbered by the high market-entry barriers that a strong IP protection system embodies, is to create a product that is nearly impossible to imitate. In other words, firms such as Alibaba, Tencent and Meituan excelled in technological improvements, so much so that the iterative process gave rise to innovation. This technology-centric explanation helps in understanding the transition, but not the formalization, of IP protection in China and, most importantly, why venture capitalists would eventually come to see IP assets as playing an important role in the future valuations of the firms in which they invest.

Another explanation, however, suggests a noteworthy interaction between reverse migrants and IP as variables. Douglas Fuller (2010) has found that Chinese foreign venture capitalists could be distinguished from their non-Chinese (i.e., non-returnee) foreign counterparts by the former group's greater willingness to invest in technology-generating activity. Fuller suggests that Chinese returnees — especially those with roots and experience in developing economies that lack formal private property protection regimes analogous to those of China — understand informal mechanisms to manage IP better than do their non-Chinese foreign counterparts. Given this finding, perhaps what has been seen in China is the gradual formalization of informal IP protection mechanisms that have always existed in the form of interpersonal relationships between the entrepreneur and the venture capitalist.

In the end, the causal mechanism connecting IP protection to VC investment is far from clear in China, and the country appears to be an outlier in the broader scope of existing literature on the connection between the two variables. However, while China is an outlier (so far), it is also one of only two contemporary, truly globalized and competitive VC ecosystems — the other being the American one. Therefore, dismissing China as an outlier risks policy makers not learning important lessons from its experience. Therefore, policy makers in emerging economies ought to think hard about appropriate sequencing of IPR enforcement, rather than observe the exceptional results in the United States and work backward to imitate their IP system.

Perhaps more importantly, developing country policy makers should take note of the Chinese anomaly because Chinese VC funds are increasingly invested abroad — especially in developing countries such as India (Yu 2020) and Southeast Asia (Zhang and Oster 2019). At the start of China's technological boom, Chinese firms were already acclimatized to operating in a weak IP environment, and venture capitalists had to get used to investing in products that were not necessarily accompanied by strong brand, patent, copyright and trade secret protection. In this hypercompetitive environment, successful entrepreneurs had to constantly justify their prices and deal with copycat competitors. Beyond the developing world, policy makers should note that China's VC ecosystem has evolved along with China's IPR system. Rather than finding ways to finance existing, proven technologies to scale and localize them in China, venture capitalists are increasingly financing early-stage, novel technology.

However, given that the sources of many cutting-edge technologies (namely R&D) are still carried out in developed countries, Chinese venture capitalists are increasingly looking for ways to fund entrepreneurs in smaller markets by allowing them to scale their technology in China. Because China's basic research capabilities still lag behind those of advanced economies, combining China's market size with advanced-economy technological capabilities allows Chinese entrepreneurs and funders to affect technological commercialization processes that would normally only be found in large advanced economies such as the United States. Due to China's improving IP protection regime (Prud'Homme and Zhang 2019) and its maturing ICT ecosystem, the potential for novel

technological innovation is gradually being realized. One such VC firm, Israel China Biotechnology, specializes in bringing US biotechnology innovations to the Chinese market. As CEO Huang Qingxi put it: “China plus Israel equals America. Because the US has both its own market and technology. We Chinese have the big markets, and Israel has the technology, so together it makes a good link-up, much better [than] the link between China and the US. In the end, China and the US will be competitors, but China and Israel will never be competitors, and so it’s better for them to go together” (Huang, quoted in Lan 2018).

Lesson 3: Government Funding Must Be Nimble

What role, if any, can government capital play in creating a viable VC market? China is not the first country to try to use government funds and industrial policy to channel funding to small and medium-sized technology companies. However, given the secular growth in VC funding in China over the past two decades and its key role in financing China’s innovations in ICT, payments and other sectors, it is useful to identify what policy makers did and did not do right in utilizing public funds to support the formation of a VC industry.

Much of the success in channelling public funds to the VC industry can be found in indirect initiatives such as providing infrastructural funds — namely, creating physical and institutional spaces for connecting entrepreneurs with venture capitalists — and providing funding for commercially viable sectors where private sector funding may not be forthcoming.

The history of government involvement in the VC sector in China has progressed in three stages. In the first instance, the central government attempted to play a leading role in providing VC-like funding to (largely) government-owned institutions. As mentioned above, the 1980s were replete with examples of government-priorities-driven VC funding, comprised largely of SOEs funding other SOEs. Evan Feigenbaum (2003) illustrates the presence of these dynamics in China’s original high-tech funding program, called the 863 Plan.

However, in the case of VC, many of the early failed experiments eventually led to a significant recalibration of state-led efforts to finance the growth of small and medium-sized technology companies. By the late 1990s, in what could be seen

as the second stage of government involvement in funding early-stage technology ventures, the strategy focused on creating the physical spaces where entrepreneurs and scientists would be able to collaborate with financiers. The first case of recalibration was the Torch Program, an initiative to create R&D commercialization zones, or science and technology parks, using a variety of funding arrangements involving central and local governments and foreign enterprises (Heilmann, Shih and Hofem 2013). Initially set up in the 1980s by scientists leaving bureaucratic positions in government, these technology and entrepreneurship “incubators” have been used for a wide variety of purposes by local governments, ranging from attracting FDI and stoking GDP growth, to incentivizing value-chain upgrading and helping talented scientists and returning entrepreneurs to start technology companies, as well as by foreign firms to access China’s network of government and university R&D (ibid.).

One of the more remarkable aspects of these science and technology parks was the lack of direct central government involvement, not only in terms of capital allocation but most importantly in terms of direct management. While broad policy goals and direction were set out in Five-Year Plans and other policy directives (which continues to be the case), the parks’ managers and local government were relatively autonomous in directing where the money went, typically with an eye to the needs of the local economy. Sometimes this led to mission creep, and local governments used technology parks for low-value-added export promotion, but in many cases, these local technology spaces led to successful commercialization of technology and spawned many of China’s present-day tech giants (Ma 2019). Empirical research suggests that, at least in the case of China, government grants and networking among entrepreneurs in these technology parks play an important role in attracting VC funding to small and medium-sized technology firms (Guo et al. 2012; Chandra, He and Fealey 2007). Government financing therefore largely played the role of facilitating the formation of human capital (not least of which involved attracting returnees, as outlined above), creating the physical infrastructure and seeding R&D commercialization funds to these spaces. The actual management of VC was done mostly by private firms.

Of course, as outlined in the first section of this paper, the early 2000s did see an emergence of government-owned and financed funds, such as the SCGC. However, there were and remain many more experiments in government-seeded capital used for technological upgrading. Some of these include university spinoffs such as Tsinghua Unigroup and Founder (see Malkin 2020), albeit these institutions play a role that resembles PE firms rather than that of VC.⁵ More significant has been the government's growing role as a supplier, but not the manager, of capital — playing the role of “legal partner” (LP) to private sector VC fund managers. An LP is, in effect, any entity (financial or otherwise) that provides funds for venture capitalists to manage, under contractual stipulation pertaining to return on investment and use of funds. It is notable, for instance, that in the early stage of the VC industry in China (from the late 1990s to the late 2000s), much of the LP cash was provided by US financial firms. The next section will explore the role that capital controls and incomplete financial markets in China played in enabling US investments to be channelled into VC. For this section, it is important to understand that by the time the United States experienced its dot-com bubble, Chinese policy makers began to experiment with collaborations between foreign and state capital, in particular in order to channel foreign financial firms' growing interest in China's financial markets into productive (as opposed to speculative) channels.

One firm that illustrates these efforts is Gobi Partners, established in 2002 by Silicon Valley VC partners and returnees Tom Sao, Lawrence Tse and Wai Kit Lau, whose careers focused on investing in Asia. Lau and Tse gained experience partnering with the Chinese government in the 1990s when they worked as investment bankers in Hong Kong, helping to raise equity funding for China's SOEs. After joining WI Harper Group, a Bay Area VC firm focusing on Asia, they managed

a VC fund set up by several SOEs in collaboration with the Beijing government in the late 1990s. Gobi Partners was formed in the backdrop of their experience working in a public-private partnership capacity with Chinese state funds. Their goal was to provide funding for early-stage Chinese technology firms, drawing together government money and LPs in Silicon Valley, to whom they offered outsized returns from China's rapid telecommunications infrastructure buildout (Hardymon and Leamon 2007). By 2012, Gobi was managing funds on behalf of the NDRC and the Shanghai Venture Capital Guidance Fund (Hui 2012).

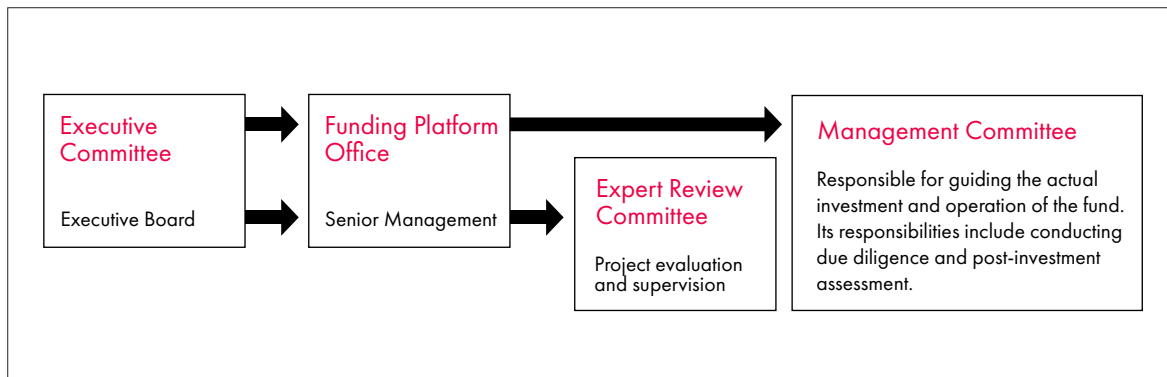
The term “guidance fund” may confuse casual observers, but in China, these government LPs and general partners (referring to the managers of VC funds) are becoming an increasingly important part of the government's role in the VC sector — what could be seen as the third and latest stage of the government's efforts to play a guiding role in financing early-stage technology. The scope of guidance funds is vast and covers a wide variety of purposes. In the case of industrial policy, these funds have been slated to invest in sectoral upgrading targets, under the Made in China 2025 plan, to look for both PE and VC investment technology firms in sectors ranging from semiconductors to electric vehicles (see Malkin 2018).

At the same time, despite the total allocated capital value of government guidance funds (GGFs) being estimated at nearly \$670 billion (Tang and Xue 2020), they have suffered from several flaws that reflect earlier mistakes made by China's enthusiastic deployment of state VC and PE funds in the 1980s. Because setting up GGFs was left to local governments, many policy makers resorted to raising target funding through off-balance-sheet shadow-banking arrangements and channelled the money to low-risk targets with stable returns — the opposite of their intended purpose. Rather than focus on firms that need seed-stage or early-stage funding, many local governments have looked for firms that are nearing IPOs (*ibid.*).

In response to these problems, the central government has again sought to recalibrate its efforts and step back from direct mandates and micromanagement. As VC/PE data tracker and consultancy firm Zero2IPO (2020) has reported, compared to previous years, the management model of GGFs has grown to become more market-oriented, as the actual management of VC funds

5 The difference between VC and PE in China is not as great as it is in other large economies. While in many advanced economies, VC and PE industries play distinctive roles — distinguished in large part by stages of investment, with PE firms known to specialize in M&As and invest in firms in a variety of growth stages, including firms in decline. PE firms also make investments in a wide range of industries, whereas venture capitalists focus on rapidly growing firms that benefit from technological disruption or novel applications of new technologies. In China, however, these lines of distinction have tended to be blurrier than they are in other, especially advanced, economies. PE and VC emerged in tandem in China and, until recently, in part due to a lack of institutionalized exit options and the persistent reluctance to invest in early-stage or seed-stage firms. In the 1990s and early 2000s, investment strategies, exit options and interest in high-tech growth firms have grown in tandem.

Figure 3: GGF Management Model



Data source: Zero2IPO (2020).

has been downloaded to local funds, a minority of which now include the private sector, and to Sino-foreign joint venture firms. Under this new model of governance, GGFs play a “fund of funds” role, managing the flow of government funding to LPs that are then slated to channel investments to private sector VC funds. The new management model, as described in Zero2IPO’s report (ibid.), is summarized in Figure 3. As the 2020 report notes, most GGFs are still managed by government-owned institutions — by central or local state-owned holding platform companies. However, the available data on the few Sino-foreign-managed funds under GGF purview that currently exists shows that these institutions outperform their wholly state-owned counterparts (ibid.).

More studies on the effectiveness, or lack thereof, of China’s government-financed VC efforts are needed. To be sure, there are existing studied examples outside the realm of GGFs, such as the Innofund, established in 1999 as part of an early effort to use state funding as a response to earlier failures of government-led VC funding, as well as persistent market failures in channelling private sector funds to promising technology start-ups. The program works by giving loan interest rate subsidies and equity financing to firms that, at the seed stage and early stage of technology firm growth, meet the government’s criteria for novel and socially useful technologies. Some research suggests that programs such as Innofund have limited impact on the overall level of innovation in the Chinese economy or on the post-investment performance of its portfolio firms (Wang, Li and Furman 2017). However, other research has shown that since 2005, with the decentralization of Innofund’s project screening approach, the fund’s impact on firm performance and innovation has been positive (Guo et al. 2012).

Overall, however, studies on the role of government funding in the success of technology-focused SMEs in China do not show a positive correlation between firm performance and state financial backing (see, for example, Zhang and Mayes 2018; Cao, Humphery-Jenner and Suchard 2013). As Dieter Ernst (2020) recently showed with respect to the development of the AI semiconductor chip sector, more government funding does not necessarily guarantee the success of early-stage firms in producing intended results in the government’s preferred funding areas. Thus far, China’s most successful firms developing AI chip sets have been tech giants such as Huawei and Alibaba, rather than semiconductor start-ups.

At the same time, Lin Lin (2017) has shown that government finance did play a positive role when combined with selective policies of VC/PE investment liberalization and a supporting regulatory environment for entrepreneurship. The key, therefore, for policy makers seeking to boost VC funding, is to take a holistic approach to public policy and to focus on reforming or strengthening every aspect of a national innovation system, from technology-focused SME growth to intangibles policy and financial system structure. The final section of this paper focuses on this last piece of the VC puzzle.

Lesson 4: Work with the Existing Financial System

One of China’s major achievements in creating a VC ecosystem is doing so in a financial system that is not known for efficient or market-based allocation of capital. Indeed, VC has thrived and grown in China, while other countries

with more liberalized financial sectors have not been able to achieve the same results.

China's approach has been not only to learn from best practices around the world but to utilize its own domestic, idiosyncratic financial system to organize its VC ecosystem. This paper has already explored the role of government, as well as China's migration policies in its policy tool kit for incentivizing the emergence of a VC ecosystem. However, much like China's lack of IP protection, another feature of China's political economy seems to have inadvertently contributed to specific conditions that helped VC to flourish, namely, incomplete markets.

China's financial markets are defined by a fundamental risk aversion on the part of regulators and the state-owned banks that drive direct lending. Lending channels for SMEs have long been lacking, and equity financing has, until the 2010s, been outsourced to non-mainland stock exchanges, notably Hong Kong and New York. The system is also defined by a reluctance on the part of Chinese authorities to relinquish restrictions on cross-border movement of financial capital. This policy is known in financial and policy circles as capital controls.

Capital controls refer to restrictions on the ability of individuals and businesses to move money across borders for the purposes of investment in financial markets. However, in practice, these restrictions in China go beyond restricting access to financial markets and restrict the movement of cash across borders more broadly. While China's system of capital controls is extensive and complex, the most relevant pronounced effect of China's long-standing policy of controlling the movement of capital across its borders has been a pronounced bias in favour of FDI and against portfolio outflows (Xiao and Kimball 2005).

China's government has been able to oversee an exceptionally rapid expansion of VC funding, all the while maintaining a strong regime of capital flow management. Indeed, the emergence of China's VC sector as the second-largest and second most dynamic and globally active one next to that of the United States is quite counterintuitive, considering China's reputation as having a relatively controlled, bank-dominated financial sector with underdeveloped domestic capital markets. So why did a large and dynamic VC sector emerge there instead of, for instance, in Europe, which was — at

the time of VC's arrival in China in the mid-1990s — far closer to the technological frontier and had far more exit options for Silicon Valley VC funds?

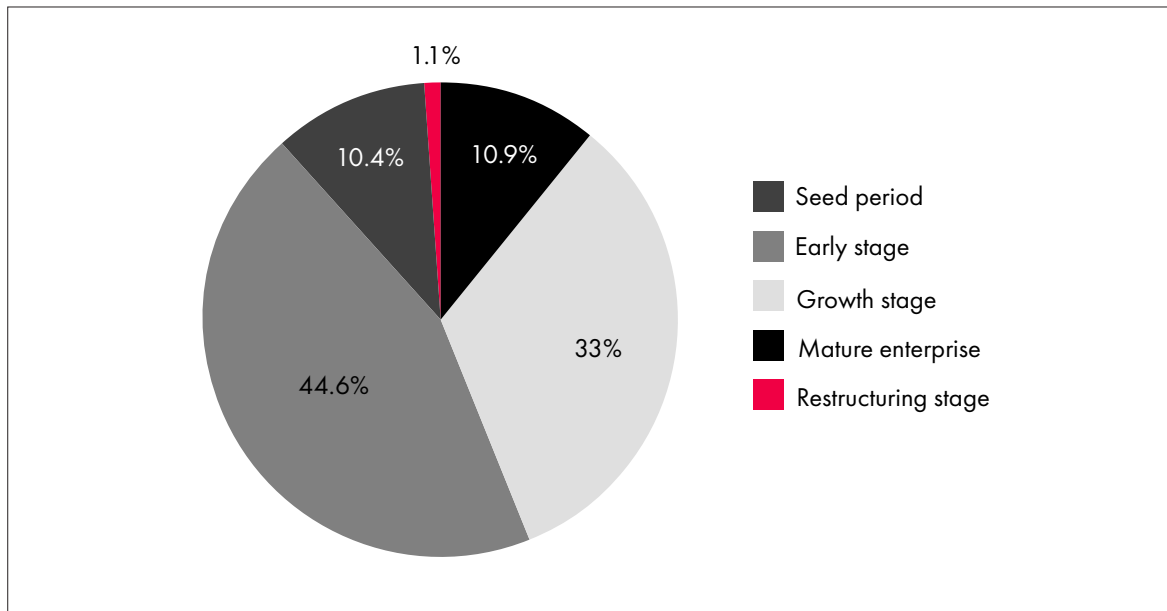
Incomplete financial markets, which in China have been defined by a lack of funding mechanisms for SMEs as well as by insufficiently developed equity markets, otherwise described as “financial repression,” can have deleterious effects on early-stage technology growth by limiting the available pool of funding. Drawing from the American experience, Ronald Gilson (2003) identified three problems that policy makers need to think about when attempting to “engineer” a VC market, including a supply of entrepreneurs; a supply of capital-seeking, high-risk, high-return investments; and specialized financial intermediaries. How was China able to overcome the simultaneity problem in the early days of the VC sector's growth?

From the previous discussion, we can see how reverse-migration policy and government support for the VC sector have contributed to overcoming the first two of Gilson's stipulations. However, given China's incomplete markets or lack of financialization, we might expect the third stipulation to be exacerbated. However, China's lack of well-developed financial markets may have helped sophisticated intermediaries coalesce around China's technological catch-up efforts through China's policy of encouraging capital inflows while discouraging outflows.

While foreign banks and other financial institutions took notice of China's potential early on in the reform and opening-up process, channels for sustained financial returns have been consistently limited, as regulators limited foreign financial institutions' participation in domestic financial markets and made it difficult to repatriate financial capital outside of China (both remain true today, to varying degrees; see Malkin and Li 2019). Domestic stock exchanges in China have not always been the best fit for the development of a thriving VC sector, largely because China's equity markets serve a variety of socio-economic aims that often conflict with the goals of VC formation. These aims included guiding financial capital toward areas consistent with state-led economic development goals, managing the supply of shares and protecting small retail stock investors from losses, and fostering SOE reform (Petry 2020).

This left foreign financial institutions with few options in mainland China but to exit through PE

Figure 4: Distribution of VC Projects by Business Life Cycle, 2018



Data source: Ministry of Science and Technology (2018).

placement — a strategy fraught with uncertainty and generally unattractive to the parent companies of China-based VC joint ventures and subsidiaries, which use public placement as a quantitative barometer to judge the attractiveness of a VC target. There was, however, one other option, namely, listing on stock exchanges abroad. Specifically, VC investors needed a proof of concept to justify their investment, and they found it in the experience of Chinese SOEs and private firms listing a part of their ownership shares on Hong Kong and New York stock exchanges.

In effect, China's capital controls regime has had the effect of attracting capital to China, but repatriation of said capital was complicated. The only way for investors and firms to access global capital markets during the early days of China's financial liberalization process was through overseas listings. Ever since Goldman Sachs's successful collaboration with China Construction Bank to list shares of China Mobile in 1997 on the New York and Hong Kong stock exchanges, respectively, the option of raising equity from global investors within the confines of China's capital

controls regime became especially important.⁶ Foreign LPs, most notably US-based financial institutions and VC investors, caught on to this trend and saw a sure way to grab a piece of China's rapidly emerging ICT industry, especially as few of China's technology firms were listed domestically until the creation of the ChiNext board in 2009.

Not surprisingly, given the lack of market-based investment options for households with capital to invest, wealthy families in China are disproportionate contributors to China's VC ecosystem (Lin 2017). Therefore, due to the inability to invest money directly abroad or in domestic financial markets, wealthy individuals in China have largely turned to PE channels for investment returns, including VC funds. Had financial capital been allowed to seek returns in developed overseas markets, such as those of Hong Kong, the United Kingdom or the United States, China's renminbi funds may not have expanded as rapidly as they had over the past decade. In addition, in recent years, investments in seed-stage and early-stage companies (see Figure 4) have grown to levels commensurate to those in the United States

6 So politically significant was the listing and subsequent Sino-foreign investment bank collaboration that then head of the China Construction Bank Wang Qishan moved up the ranks to join the State Council under Xi Jinping, and Goldman Sachs Asia head Hank Paulson went on to become US Treasury Secretary under President George W. Bush.

(PitchBook et al. 2020), with exits via the IPO channel on the rise as well (Zero2IPO 2020).

Overall, the causal mechanisms linking incomplete markets to the growth of VC, specifically, and PE, more broadly, are not clear, and the analysis here only offers a very cursory assessment of the potential relationships among them. However, China's experience shows that institutional obstacles can, in some ways, be turned into advantages. Moreover, it shows that ideal financial structures for VC ecosystem growth may not, in fact, exist. It also shows that rather than imitating VC leaders such as China and the United States, policy makers across different national jurisdictions need to think creatively about financing innovation.

The preceding analysis suggests that capital controls may have played a role in encouraging the proliferation of VC formation. However, the nature of causal linkages is not entirely clear, and the counterfactual, that China would not have seen such impressive growth in VC funding in the absence of capital control, is not entirely straightforward. This is because China's capital control regime has never been unidirectional or consistent, with periods of liberalization being followed by periods of tightening (Malkin and Li 2019). Moreover, financial repression in China has been matched with a great degree of deregulation, in particular in the fintech and other emerging technology spaces. Ascertaining the appropriate mixture of financial tightening and financial liberalization is far beyond the scope of this paper. Nevertheless, China's example does show that an emerging market does not need to achieve financial maturity before exploring ways of creating sophisticated funding channels for technology ventures and entrepreneurship.

China's relatively restricted and idiosyncratic domestic political economy, the growth of VC may have been *sui generis*, but the case for learning from China's experience remains strong.

Some have suggested that a lot of the growth in China's ICT sector — the part of China's economy on which its VC ecosystem thrives — has been due to restrictive policies against foreign ICT firms. However, recent research on the subject has cast doubt on this idea (Li 2019). More accurately, China's experience demonstrates the flexibility and range of policy-making options for countries looking to expand the channels for financing entrepreneurial activity.

Rather, the most discernible restrictive policies employed by policy makers identified in this paper are capital controls. But capital controls were just one of at least several that have helped China to achieve its VC goals. Most notably, China has clearly taken advantage of the global movement of labour, ideas and FDI to facilitate entrepreneurship funding. State funding played an important, but not the leading or defining, role in China's overall policy mix. This suggests that for some economies, market-oriented, decentralized state funding channels will play an important role in the facilitation of VC formation, while in other cases, state funding may be counterproductive. As with many policy successes in China, the state played an important infrastructural role, but outcomes were largely decided by market actors.

Conclusion

This paper has examined the evolution of China's VC ecosystem and drawn four lessons from China's experience that could be applied to policy making across countries at different stages of economic development. It has underscored the role of labour migration policies, careful implementation of IP law, the role of government finance, and the role of financial system structure in facilitating the growth of a VC ecosystem. Given

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