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Beck, Kasper Ingeman ; Larsen, Mathias

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Financialization and an emerging "green investor state": Examining China's use of state-backed funds for green transition

Kasper Ingeman Beck

Department of International Economics, Government and Business, Copenhagen Business School, Frederiksberg, Denmark

Mathias Larsen

Watson Institute for International & Public Affairs, Brown University, Providence, Rhode Island, USA

Abstract

China is simultaneously enacting a state-led financialization of governance and a prioritization of environmental objectives. Resultingly, dedicated state-backed green funds have grown in scale beyond US$70 billion. Drawing on interviews, policies, and financial databases, we examine these funds through policy document analysis, descriptive statistics, and three case studies. Tying together the literature on "financialization" and the "green state" we show how China's "market-driven, government-guided" type of state-led financialization enhances the country's green state investment capacity. This is distinct from other countries' experience of diminishing capacities resulting from financialization of the state. We introduce the concept of a "green investor state" to capture China's approach and argue that the approach is difficult to replicate beyond state-capitalist economies. However, the gradual return of industrial policy elsewhere makes the use of similar funds increasingly feasible globally, warranting further research on the use of green funds under none-state-led types of financialization.

Keywords: China, climate change, environment, financialization, green state, public finance.

1. Introduction

Today, prioritizing environmental sustainability is a defining feature of China's political economy. After a growth-above-all economic model wreaked havoc on the environment for decades, the government has embarked on a journey to transition the economy into an environmentally sustainable and carbon-neutral economy (Huang, 2020). For example, China now has the largest renewable energy capacity in the world (IRENA, 2022). At the same time, the country is taking a new "grand steerage" approach to economic governance (Naughton, 2020). Steering resources into strategic sectors expected to bring productivity growth is increasingly financialized (Wang, 2015), such as direct state financing via "government guidance funds" (Pan et al., 2021). As a result of these two developments, green state-backed funds have proliferated since 2016. Explicating how green funds change the way the Chinese state drives green transition can provide input to the global discussion on the role of the state in green finance which has become a crucial topic for political economy. This paper examines the role of the state in green transitions by focusing on China as an emerging "green investor state."

Globally, we see a burgeoning literature on both "financialization" and the "green state" concept. First, the literature on financialization emphasizes the financialization of the economy (Carruthers & Kim, 2011), the relation between state and finance (Krippner, 2011), and the power of financial actors over the state (Braun, 2020). Demonstrating the unique characteristics of financialization in a Chinese context, the literature documents that, increasingly, China is using financializing governance, but keeping the state firmly in control in the process. (Chen & Rithmire, 2020; Liu, 2021; Wang, 2015). Here, we use Pan et al.'s (2021) conceptualization of Chinese "state-led" financialization, highlighting that as opposed to many Western cases, financialization in China has led

Correspondence: Mathias Larsen, Watson Institute for International & Public Affairs, Brown University, 111 Thayer Street, Providence, RI 02912, USA. Email: mathias_larsen@brown.edu
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to increasing state influence on the economy through a "market-driven, government-guided" principle. Second, the green state literature argues that states must take an activist and interventionist role to steer a green transition (Craig, 2020; Gabor & Braun, 2023; Larsen, 2024b). It focuses, among other things, on how states should finance a green agenda, and highlights the difficulties in providing direct state investment (Kedward et al., 2022; Mazzucato, 2022). While China is rarely mentioned in the green state literature, we argue that the country is relevant to the green state concept as it takes a highly interventionist approach and is successfully developing green industries. Tying together the literature on "financialization" and the "green state" we explore how China's state-led financialization enhances the country's green state investment capacity. As Chinese green funds are a product of financialization that facilitates direct green investment by the state, the funds can provide critical insights into the conceptual link between theories on financialization and the green state.

We find that state-led financialization and increasing environmental priorities in China has created a proliferation of funds that has enhanced the state's capacity for green investing. We arrive at that conclusion through a three-part analysis. First, we show that policies in and around green funds indicate that the funds play a central role in the policy frameworks governing the greening of the economy. Second, descriptive statistics of green funds show that these funds rose to prominence after the party-state launched a green finance effort in 2016 and that such funds are now among the state's key policy tools in its drive for a green transition. Third, our three case studies demonstrate that provincial-level governments are the key initiator and financier of green funds, which, through equity investments, support local green industries as well as help restructure polluting industries. Cumulatively, the findings suggest that China is gradually becoming a "green investor state." We find that the state-led dimension of Chinese financialization is critical to the use of funds, and therefore argue that the approach is not directly replicable at the same scale beyond state-capitalist economies. However, the global return of industrial policy and identification of a "European investor state" (Lepont & Thiemann, 2024) makes the use of similar funds increasingly feasible elsewhere.

2. Financialization, the green state, and the potential insights from the case of China

2.1. "Market-driven, government-guided" Chinese state-led financialization

The literature on financialization emerged in the 1980s and has proliferated over the last two decades. According to Wang (2020), this literature can be categorized into scholarship concerned with the economy or the state, and most belongs to the prior. The literature on the financialization of the economy emphasizes and financialization of everyday life (Erturk et al., 2007), the increasing role of financial institutions in the economy (Carruthers & Kim, 2011), and the rise of shareholder value as a model of corporate governance (Fligstein & Shin, 2007). Overarchingly, this literature identifies a shift from industrial to financial capitalism as a new regime of accumulation (Epstein, 2005; Van der Zwan, 2014).

This article builds on the financialization literature concerned with the state. Wang (2020, p. 604) defines this type of financialization of the state as "a process in which the state increasingly relies on a set of financial means to manage its assets and fund public investments …, through (a) the introduction of shareholder values by the state to managing its assets, (b) the expansion of non-banking financial institutions to manage these assets and (c) the provision of financing vehicles by these institutions for state-led fixed asset investment." This can be summarized as the state "governing through markets" (Braun et al., 2018). The literature portrays a complex picture of power, dependence, and coordination between state and private finance as a product of financialization of states' governance and management of the economy.

One branch argues that financialization reduces the policy range of states in steering the economy (Helleiner, 1999), exposes the state to financial speculation (Lagna, 2016), and introduces conflicts with democratic institutions (Schwan et al., 2021). Recent scholarship has discussed how financialization gives power to financial actors over the state, such as through the banks' "infrastructural power" of banks or the concentration of capital in asset managers (Braun, 2020). Another branch emphasizes how states have driven and used such financialization for political purposes, such as to solve fiscal problems by creating markets for sovereign debt (Massó, 2016) and solve political problems by shifting housing finance from state budgets to capital markets (Krippner, 2011). Recent scholarship on financialization and the Global South shows how global financial actors

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can exercise undue power over periphery countries (Santos, 2022) and how states are increasingly large owners of capital (Babić, 2023).

Chinese financialization is distinctly different. Financialization of economic governance in China reflects the idea of a "market-driven, government-guided" (*shichang zhudao*, *zhengfu yindao*) economic system, which is the foundational principle under the Xi administration's overall approach to accelerating China's transition to a new growth model (State Council, 2014). The Chinese Communist Party believes fundamentally that the Party must guide, steer, and protect the economy and the private sector's main purpose is to support the transformation towards political goals and priorities. In this sense, financialization of the Chinese state sector is a unique type of market-building reform that anticipates state-building. The regulatory state is still in place, but financial instruments are now emphasized over regulation. To highlight and capture the different characteristics of financialization in China, we use the term "state-led financialization" as coined by Pan et al. (2021).

Key scholarship on Chinese financialization demonstrates the state-led nature in implementing the "market-driven, government-guided" principle. Regarding state funds, Pan et al. (2021) show how the state decides the sectors while portfolio managers ensure market efficiency. Petry (2020a, 2020b) finds that "state-capitalist capital markets" have different institutional logic than neoliberal with state interfering in markets to align with state objectives. Chen and Rithmire (2020) argue that a Chinese "investor state" deploying capital strategically to shape the private sector. In comparison with the literature on Western financialization of the state, the Chinese case is similar in the motivation for governing through markets "a political strategy adopted by state actors in pursuit of policy goals that exceed their institutional capacity" (Braun et al., 2018, p. 101).

The funds under scrutiny in this paper are in this way a product of financialization. Critically, as suggested by the above-mentioned scholarship, Chinese state-led financialization is different in terms of steering the market and maintaining state control after financialization. Rather than seeding control by relying on financial actors to implement policy purposes, China ensures control over the financial actors such as through asset ownership, as regulator, and through party-committees inside private actors. This fits broader conceptualizations of China's political economy model as combining market-mechanisms to increase efficiency with government intervention to ensure political control and steer the economy to be aligned with party-state goals (Naughton, 2020). This idea of combining markets and political steering also dominates state-owned institutional investors. As expressed in interviews with the National Social Security Fund, a state-owned asset owner, capital should be allocated in accordance with the interest of the people as best expressed by the party-state.[1] As a result, state-led financialization China is not consequential in terms of the power and distributional dynamics emphasized in Western-oriented literature.

The history of financialization of economic governance in China can be traced back to the shareholding reforms and mass corporatization in the mid-1990s, which fundamentally changed the state-owned enterprise (SOE)–government relationship from administrative domination to corporate control (Wang, 2015). It was cemented with the creation of State-owned Assets Supervision and Administration Commissions (SASACs), which in 2003 became the "sole representative of state ownership" in China. Local SASACs continued to push for reforms, aiming to make corporatized shareholding companies the main organizational form in China. Most recently, the SOE reform package rolled out since 2013 focuses on diversifying ownership structures of SOEs and changing the state's role from "management of (material) assets" (*guan zichan*) to "management of capital" (*guan ziben*) (Beck, 2022; CCP, 2013; State Council and CCP, 2015).

The capital management approach implies an intention to further reduce the government's involvement in business management and instead focus on supervising state-owned capital in a shareholder capacity. The financialized system is intended to mitigate pathologies associated with the lack of oversight and monitoring in the "old" SASAC-based system: a massive and complex state-owned sector can better be managed by setting up professional state-controlled capital management firms (in line with Temasek in Singapore). These investment firms should eventually replace the holding group companies and, on behalf of the state, exercise shareholder rights and invest state assets, for example, through government-guided investment funds. The state is "layering" new instruments of financial steerage on top of, though not as a replacement for, an existing market economy. As a result, the Chinese state is being "remade in the image of a large conglomeration" (Wang, 2020, p. 195). Financialization in this system becomes a state-building process where large parts of the market are comprised of state actors in different layers.

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Current literature on government-guided investment funds quantitatively describes their extent and qualitatively explains their governance structure (Guo & Wu, 2020; Luong et al., 2021; Pan et al., 2021). In practice, funds are the most important concrete tool for steering the economy within this new financialized organizational structure (Huang, 2019; Pan et al., 2021). The three central-level capital operations companies (State Development & Investment Corporation, China Reforms Holdings Group, and Chengtong Group) manage more than 22 funds with combined assets of more than 1.8 trillion Yuan (authors' calculation based on CVSource data). Yet, this is less than 20 percent of the total volume of 10 trillion Yuan, with the rest controlled by local-level governments (Naughton, 2021, p. 107). The most sophisticated and proactive governments, notably those in Wuhan, Nanjing, and Shanghai, have established funds as integral components of local government development plans to implement core strategic objectives. There are also many cases where central-level funds and capital operation companies participate as limited partners in local funds. Overall, at least 61 percent of funds, and more likely about two-thirds, are directly related to industrial policy priorities, such as support for strategic emerging industries (Naughton, 2021, p. 108). While these funds' overall governance structure and scale have been covered in the literature, their role in China's green transition has not been investigated.

2.2. The green state in a Chinese context

The idea of a green state arose from an exercise in normative political theory but has evolved to also include empirical, pragmatic, and practice-oriented dimensions (Larsen, 2024a). Advocates observed that states influenced by neoliberalism failed to address environmental crises in the 1980s and 1990s, but that interventionist states successfully engaged with problems beyond the environment, such as ensuring financial stability, driving growth, steering innovation, providing social development and security, and, most recently, managing the COVID crisis (Kedward & Ryan-Collins, 2022). From visions of a passive and minimal night-watchman state, the return of an interventionist state is, in part, a response to a number of recent global problems, such as the global financial crisis, increased competition from a rising China, and increasing inequality caused by globalization. These have all been met by substantial state intervention. This return of the state has been captured by a diverse set of literatures that include those addressing industrial policy (Aiginger & Rodrik, 2020), the re-emergence of state capitalism (Bremmer, 2008), and the return of the entrepreneurial state (Mazzucato, 2011).

A two-part consensus definition sees green states as actively using the state apparatus to achieve environmental goals and privileging environmental protection as a political objective at least on par with gross domestic product (GDP) growth (Bailey, 2020; Duit et al., 2016; Eckersley, 2016).[2] The impact on growth depends on whether the state takes a green growth or degrowth perspective (Buch-Hansen & Carstensen, 2021). These definitional criteria imagine a state form that can be used as an analytical tool to capture real-world phenomena as well as a normative ideal that states should strive for (Craig, 2020; Hausknost & Hammond, 2020). The literature focuses both on explicating ideal types of green states and discussing practical examples of states with some, but not all, green characteristics.

Financing green development has been a central part of the green state literature. This scholarship argues that states should comprehensively use a broad range of policy tools on the demand side, such as purchase subsidies and tax rebates, and supply side, such as state investment and regulations (Bolton et al., 2020; Green, 2022; Mazzucato, 2022). Problematically, while state support for green development has been expanding, less progress has been made on the equity financing aspects of the supply side. Recent green industrial policies in the United States and the European Union (EU) manifest the problem of overreliance on subsidies rather than state investment (Gabor, 2023). The US Inflation Reduction Act provides large-scale consumption subsidies, tax rebates, and a smaller amount of credit, but very limited equity finance (Paris et al., 2022). For example, about three quarters of the Inflation Reduction Act's commitments are in the form of tax rebates (US Treasury, 2023). With the uncapped nature of the tax credits, sometimes referred to as "bottomless mimosas," the actual costs could increase from US$400 billion to more than US$1 trillion (Saul, 2023). This emphasis on tax rebates is likely to be similar in the EU, but given the leeway for each member state to implement industrial policy, it remains unclear in the initial official documents (EC, 2023). Both the United States and the EU also "govern through ESG standards" as a way to direct capital, though the impact of this approach remains highly questionable (Fichtner

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et al., 2024). Furthermore, while Western countries have large public pension funds, these have a clear for-profit mandate and are outside the control of the state for the use for policy objectives.

A key reason for the tax rebates approach may be that it is more difficult politically to allocate a fiscal budget or increase taxes than it is to reduce taxes. In addition to its green purposes, the Inflation Reduction Act, as its name suggests, aims to reduce inflation by limiting public spending. Consequently, it includes limits on direct state investing. Similarly, the EU does not allocate additional budget for its green industrial plan as it is too politically difficult, but instead redirects money from the Pandemic Recovery Fund (Joyner, 2023). Gabor (2023) argues that the only type of green industrial policy possible within the EU's macrofinancial constraints is a derisking approach focused in tax incentives, loans, and guarantees. While the scale of both plans enables an impactful rollout of green technologies, the approach is likely to work only for already mature technologies. This is a problem as the literature recognizes the importance of equity support to develop new technologies and scale emerging green industries in which the private sector does not adequately invest (Mazzucato, 2015a). By extension, as Gabor (2021) argues through the concept of the Wall Street consensus, the power of finance limits states to using derisking tools as their main form of policy tool to drive green transition.

Chinese green funds can contribute to this debate as they are a product of state-led financialization that allows for public investment in green equity assets, which are identified in the literature as critically insufficient. Therefore, the funds can be used to explore how financialization shapes a state's ability to provide such equity financing. The extensive literature on green development in China suggests that while China has central green state characteristics, it is by no means an optimal one. We agree that China's approach to the environment is far from optimal, yet we find that the government is consistent with the two-part consensus definition presented above. First, there is no question that China actively uses the state apparatus for not only the green transition but also essentially all other policy goals. Such an approach is rooted in a governance model featuring a strong party-state that intervenes at all levels of the economy, from central plans and financial system control to local government incentives and party committees inside companies (Economy, 2018; Lardy, 2019; Naughton, 2020). While the intensity of state intervention has waxed and waned, state-driven approaches have been central to China's success in green industries (Naughton, 2020). So-called "fang-shou cycles" (*fangshou xunhuan*) refer to shifts back and forth between relaxing state control in an area before increasing it again (Baum, 2018), as seen, for example, with capital account opening around 2015–2016 (Orlik, 2020).

Second, in both rhetoric and practice, China is willing to prioritize the environment on par with growth. This claim is widely supported in the literature (e.g., Shen & Jiang, 2021; Zhang, 2021b). In practice, over the last 10 years, we have seen examples such as the closing of factories to meet air pollution standards (Schmitz, 2017), rapidly increasing pollution fines (Chang et al., 2020), turning farmland back into forest (Dayne, 2017), and introducing a national carbon trading scheme (Nogrady, 2021). Furthermore, China is successfully developing green industries, as shown by the fact that China is home to 40 percent of total global wind capacity (GWEC, 2022), 40 percent of global solar capacity (IRENA, 2022), and 52 percent of worldwide electric car sales in 2021 (IEA, 2022).

At the strategic policy level, we see the introduction of green concepts since the mid-2000s and an increasing emphasis on these ideas in recent years. These include "ecological civilization," "two mountains theory," and the "new development concept," to mention a few among many. Most recently and of importance throughout the country, the upper echelons of China's government linked climate policy linked to its foremost goal, namely, "national rejuvenation" (State Council, 2021). Beyond these policy areas, China integrates green priorities into areas unique to China's governance model, such as five-year plans, cadre evaluation systems, and mandatory ideology study sessions (Lan, 2022; Wu & Cao, 2021). Still, the country's environmental performance has been far from optimal. China built 76 percent of the world's new coal plants in 2020 (Global Energy Monitor et al., 2021), its climate targets are "highly insufficient" to meet the Paris Agreement (Climate Action Tracker, 2024), and it uses the lowest applicable environmental standards when investing overseas (Voituriez et al., 2019).

In essence, China is doing well on supporting green industries and poorly on reducing polluting industries. The positive experience with green industries gives China a set of green state characteristics that can be used to speak to green state theory. Despite its green state characteristics, China is rarely mentioned in the green state literature. We seek to remedy this exclusion, even as we acknowledge that the literature has provided a broad and fruitful debate on how states can and do drive a green transition in the Global North. While we do not consider

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China (or any other country) an optimal green state, its experience in financing green industries through state-backed funds renders its experiences relevant to green state theory.

3. The role of state-backed green funds in China's green transition

We apply a mixed-methods approach to analyze what China tells us about how state-led financialization shapes the green state's financing abilities: First, we draw on insights from 50 semistructured interviews carried out in China between 2017 and 2021, covering central and local governments, financial institutions, research organizations, and NGOs. Interviews were carried out primarily in Beijing with interviewees working on the overarching greening of the Chinese financial system. As such, they provide key insights into the logic of using green funds but less details on how the funds work on the ground. Second, we draw on policy documents from government webpages and online databases (PKU Law and CNKI) to support a policy document analysis on the role of green funds in China's governance approach. Third, we draw on the CVSource (*Touzhong Shuju*) database of Chinese capital funds to provide descriptive statistics and analysis of fund proliferation, in addition to manually drawn data from QiChaCha (a Chinese company registration database) on fund investments. Fourth, policy documents, media reports, and company reports provide the foundation for three case studies of green funds—nationally and in Jiangsu and Guizhou provinces—illustrating how green funds are used in practice. Across these analyses, in addition to the latest academic literature on the topic, we further compare and triangulate information from research reports, media articles, and public statements. By using material in both English and Chinese, we ensure comprehensive coverage and meaningful dialogue between theoretical and empirical resources.

3.1. Dissecting green funds' role from policy documents

Policy documents provide key insights into how the Chinese government envisions the role of funds in China's green transition (Pan et al., 2021). In this regard, policies with three scopes are relevant to explaining how green funds function and what role they are intended to play, from the perspectives of the party-state at both the central and provincial levels. Table 1 covers three categories of policy documents: policies on green transition, policies on government guidance funds, and specifically green finance policies. The latter draw heavily on the prior two overarching categories while including greater detail on the role and intention for green funds. The policies from the highest governing party or state body are prioritized, as these are most influential, measured by how frequently they are referred to in other policies, official Chinese media outlets, and literature on the topic (Doshi, 2021). Also, most of today's high-impact policies were launched within the last seven years, with just one policy dating back to 2010. In essence, the policies show the increasing financialization of environment governance and the central role of the funds within that.

Overarching policies take the form of guidelines (*zhidao yijian*), opinions (*yijian*), plans (*fangan*), and decisions (*jueding*). These provide the foundation for the laws (from the State Council) and regulations (from ministries and regulatory bodies) that operationalize and administer the policies in practice. This section explores how the Chinese leadership sees the role of funds in the green transition, so the policies are in focus.

In essence, several trends become apparent when considering the three parts of Table 1 together. First, most policies are guidance documents, suggesting that funds are prioritized at the overarching and strategic levels. Second, some policy documents have been issued from the highest levels of government, including the State Council and ministry-level bodies, showing strong government support and emphasis. Third, the main contents suggest that funds are a key way of using public funds to channel private capital[3] towards green priority areas. The funds guide private money in the sense that they point to political priority areas. As such, private investments often follow state investments, such as in electric vehicles. Lastly, within all three scopes, policies show clear coherence between each other and with regard to the highest-level policies found in CCP congress reports and resolutions. This is seen, for example, in environmental policies' increasing emphasis on funds after the 2016 "Guidelines for Establishing the Green Financial System" (hereafter: Guidelines) (PBOC, 2016) were launched. Concretely, the Action Plan for Reaching Carbon Dioxide Peak Before 2030 indicates the central role of the funds within the financial system in stating that "We will make an all-out effort to develop green credit, equity, bond, insurance, fund, and other financial instruments."

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Table 1 The role of green funds in key policy documents

Policy category	Policy name	Issuer	Year	Main content	Green funds aspect
The role of government guidance funds in policies on green transition (*Source*: Authors' compilation)	Opinions on Further Promoting the Development of Ecological Civilization	CCP Central Committee and State Council	2015	Socialist ideological underpinning of green development	Mentions need for fiscal support for funds
	Integrated Reform Plan for Promoting Ecological Progress	CCP Central Committee and State Council	2015	Goals and tools for environmental protection	Promote the establishment of all types of green funds
	Comprehensively Tightening Ecological and Environmental Protection and Lawfully Promoting Triumph in the Uphill Battle for Prevention and Control of Pollution	State Council	2018	Improve environmental management	Mentions the need for a national fund
	Working Guidance for Carbon Dioxide Peaking and Carbon Neutrality in Full and Faithful Implementation of the New Development Philosophy	National Development and Reform Commission	2021	Plan and tools for decarbonizing the economy	List funds as a key tool for financial support of decarbonization
	Action Plan for Reaching Carbon Dioxide Peak Before 2030	National Development and Reform Commission	2021	Overview of economic areas to be reduced	Lists funds as priority mechanism for economic policy support
The role of green funds in policies about government guidance funds (*Source*: Authors' compilation based on Pan et al. (2021))	Decision on Accelerating the Cultivation and Development of Strategic Emerging Industries	State Council	2010	Use funds to guide private capital into emerging industries	Green sectors are listed among main priorities
	Guidance on Innovation Investment and Financing Mechanisms in Key Areas to Encourage Social Investment	State Council	2014	Drive innovation of public innovation and financing mechanisms	Environmental protection is listed first among priorities
	Opinions on Several Policy Measures for Vigorously Promoting Mass Entrepreneurship and Innovation	State Council	2015	Encourage government bodies to establish guidance funds	Green issues listed in passing among many others
	Some Opinions on Promoting the Sustainable and Healthy Development of Venture Capital	State Council	2016	Scaling up and controlling venture capital markets	Centered on the New Development Concept, which includes green
	Opinions on Deepening the Reform of Investment and Financing System	CCP Central Committee and State Council	2016	Encourage using funds to steer the economy in a strategic direction	Supports the New Development Concept, which includes green

(*Continues*)

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Table 1 Continued

Policy category	Policy name	Issuer	Year	Main content	Green funds aspect
Policies specifically about green finance (within which green funds are a key part) (*Source*: Authors' compilation based on Wang and Xu (2020))	Guidelines for Establishing the Green Financial System	State Council and seven ministry-level bodies	2016	Eight aspects of greening the financial system.	Green funds are listed as a key tool, nationally and locally
	Decision to Establish Green Finance Reform and Innovation Pilots	State Council	2017	Establishing five green finance pilot zones	All pilots will establish green funds
	Green Investment Guidance	Asset Management Association of China	2018	Encourage asset managers to invest greener	Encourage increase green investment by funds
	Guidelines for Financial Services for Greening Private Companies	Ministry of Ecology and Environment	2019	Improve financial service for companies to become greener	Encourage the establishment of green funds
	Guiding Opinions on Promoting the High-Quality Development of the Banking and Insurance Industries	China Banking and Insurance Regulatory Commission	2019	Align with New Development Concept	Encourage participation in sustainable funds

Source: Author's compilation.

In the policies of the first category regarding the environment, funds are identified as one lever among many in China's green transition. Furthermore, while China has regularly issued green policies for decades, the emphasis on funds in these policies has increased in recent years. The policies also show that the highest levels of the party and state support using funds to further green transition. The list also indicates that China considers green transition as a goal to be achieved through economic planning since the transition is embedded in the National Development and Reform Commission's recent and most concrete plans for meeting climate goals of peaking greenhouse-gas emissions by 2030 and reaching carbon neutrality by 2060.

As indicated in the second policy category regarding funds, environmental concerns are listed in all documents. Some were set up with these concerns in clear focus, while in others they were included within a long list of purposes. Second, all the highest-level policies in the area were issued by the State Council, with one policy including the CCP Central Committee, suggesting that establishing funds is prioritized at the highest levels of China's party-state. Third, though the table does not emphasize this trend, it is apparent that the number of policies associated with establishing funds has increased in the current decade. This is well in line with what we would expect from the financialization process described earlier. The seminal financializing decision was taken in 2013 and, after taking a few years to operationalize this fundamental decision, most policies were launched during 2014–2016.

In the third category, on green finance, policies have proliferated since the Guidelines were released in 2016 (Wang & Xu, 2020). The Guidelines were issued as a "1 + N" policy framework, which means that the Guidelines provide a list of subpolicy areas where more policies are issued as the "Ns."[4] Green funds are one such subpolicy area.[5] In comparison with the issuers of the two first categories of policies, a broader range of policymaking entities issue green finance policies. This is because, after the Guidelines were jointly issued by the State Council and seven ministry-level bodies, each body is responsible for driving progress on green finance within its respective area. While the Guidelines policy document sound flexible, interviewees in central and local government organizations expressed that it has "teeth" in the sense that organizations were held directly accountable if they did not deliver on the affiliated performance indicators.[6] One set of guidelines was issued by the Asset Management Association of China, which, though not a state body in principle, takes part in governing the asset management industry on behalf of the state. Interviews with key architects of the Guidelines highlight that while the funds' role in these policies is to provide important direct equity investments, they also play a role in

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steering private capital because "85% of the capital needed for a green transition needs to be sourced in the private sector, while the state can only provide 15%."[7] This approach is exactly aligned with the "market driven, government-guided" principle of China's state-led financialization.

Clearly, green funds are not considered an environmental silver bullet, but one tool among several harnessed by the green policies. The policies put most emphasis on shaping credit and capital markets,[8] rather than on the equity financing that dominates the funds' operations. Lastly, as an indication that green finance is a policy priority, Xi Jinping mentions the concept in both of his reports to the CCP National Congress (Xi, 2017, 2022). Considering the chronology of the policies across all three parts of Table 1, it is clear that financialization of the state is not a product of China's green ambitions but shapes how they are carried out in practice.

3.2. The scaleup of green guidance funds in China

Drawing on the CVSource database of Chinese capital funds, we identified 113 "green" funds[9] based on ownership characteristics and fund name; we restricted the search criteria to funds labeled "government guidance fund" or funds controlled by a "government agency," "sovereign wealth fund" or a "university." The identification of the funds was based on their names, which were required to include one of the following keywords: green (*lvse*), environmental protection (*huanbao*), low carbon (*ditan*), pollution (*wuran*), or sustainable (*kechixu*). This conservative and restrictive approach implies that our data only covers dedicated green funds and does not include investment by other funds that also are expected to invest in projects related to green transition. There is also a possibility of some green funds not being captured by this restrictive sampling approach. In our dataset, around 6 percent of all government guidance funds were labeled "green."[10] Finally, there is very limited public access to comprehensive data on all the funds' investments. However, roughly a quarter of the funds are setup as venture capital firms or limited partnerships. For these funds, we have been able to trace some of their equity investments into green companies (see Tables 2 and 3 for examples of investments from Guizhou and Jiangsu).

Figure 1 shows the development of green funds from 2009 to 2021. A rapid increase in the number of funds happened around the end of 2015, which corresponds with the introduction of several important policies on financializing economic governance and the initiation of major reforms in the state-owned sector, including a new focus on capital management in the state sector. As such, the increase in green funds reflects the broader shift to state-led financialization. From the beginning of 2020, we can observe a flattening of both curves. This indicates financial and political restraints associated with COVID-19 containment efforts.

Figure 1 also shows the total targeted assets of green funds in China from 2009 to 2021. The figure shows a large and sudden increase in the total assets of green funds around the beginning of 2016, when several large local funds were established, notably the "Beijing-Tianjin-Hebei Ecological and Environmental Protection Mother-Fund" with a 50 billion Yuan (US$6.9 billion) funding target, the "Sichuan Urban and Rural Green Development Industry Guidance Fund" with 40 billion Yuan target, and the "CECEP Haiyan Green Development Investment Fund" with 20 billion Yuan as funding target. Mid-2017 witnessed the establishment of the 80 billion Yuan "Jiangsu Ecological Environment Development Fund" (JEEDF) and a few other very large funds. Finally, in the middle of 2020, the Ministry of Finance, the Ministry of Ecology and Environment, and the Shanghai municipal government concluded the financing of a central-level 88.5 billion Yuan "National Green Development Fund" (NGDF) intended to broadly support Xi Jinping's policy vision of a "Beautiful China." As expressed in several interviews with officials from financial institutions and the government, NGDF funding had been delayed due to the Ministry of Finance's lack of green ambitions and fiscally conservative nature. Interviewees explained that the Ministry of Finance was too busy controlling local debt levels to prioritize green transition.[11]

The large number of provincial green funds shows that central-level policy directives were implemented mainly at this level, which raises questions about regional variation in the country's green transition. In interviews, local government officials frequently expressed that a lack of financial support from the central government meant they needed to carry the financial burden themselves.[12] Figure 2 shows that the wealthy eastern provinces of Jiangsu, Zhejiang, Beijing, and Guangdong are leading in the number of funds. However, the western provinces of Gansu and Sichuan also have many green funds. Looking at the funding scale in Figure 2, we can also see that Gansu, Sichuan, and Guizhou have allocated significant amounts to green funds. Their levels are noticeably higher than Guangdong, but less than Jiangsu, Shanghai, Beijing, and Zhejiang.

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Table 2 Overview of three case studies

	Guizhou funds	Jiangsu funds	National fund
Key features	Poor in-land province. Shifted focus towards green development since around 2016. Three green funds with funding target of 44.3 billion Yuan.	Affluent coastal manufacturing hub. Early standard-setter for local green policy plans and instruments since around 2011.15 green funds with funding target of over 100 billion Yuan	National-level fund. Single largest and most influential green fund in China. Established in 2020. Initial funding of 88.5 billion Yuan
Organization and management	Two-tier structure with mother-subfunds. Substantial government intervention and control. Partnerships with local and national banks.	Two-tier structure with mother-subfunds. Marked-based approach with some level of government approval of projects. Partnerships with local and national banks.	Two-tier structure with both mother-subfunds and direct equity financing. Marked-based approach with some level of government approval of projects. Partnerships with local and national banks.
Financing	Emphasizes equity financing over debt financing	Emphasizes equity financing over debt financing	Emphasizes equity financing over debt financing but do also provide guarantees
Investment focus	Targeted approach: Tourism, forestry, and ecological restoration	Holistic approach: Polluting asset disposal, green industrial upgrading, environmentally detrimental facility-upgrading	Support for local government subfunds and equity investments: Energy conservation, environmental protection, resource recycling, new energy resources

Source: Authors' compilation.

Viewing the data in the context of local policy documents, we can see how the roles of green funds change from one locality to another. For example, Zhejiang and Jiangsu use green funds to transform and upgrade their strong industrial bases while cleaning up old and polluting industrial sites (Jiangsu DEE, 2017). Guangdong and Shanghai are exploring new green-compatible development models (Guangdong Provincial Government, 2018). Gansu, Sichuan, and Guizhou are looking for ways green funds can guide the economic transformation and development of underdeveloped and rural regions in the West, including greener agriculture and food production (Guizhou NDRC, 2018; Wang & Xu, 2020).

3.3. Case studies: Guizhou, Jiangsu, and the national fund

To identify the characteristics of funds and illustrate their practices, we conduct three case studies to understand the funds role as part of state-led financialization and of how they provide equity financing supporting green companies. They also illustrate how the political economic diversity subnationally in China influences the application of green funds a policy tool. Guizhou and Jiangsu provinces stand out as leaders in large-scale local green fund investments. They were selected as two diverse case provinces as they represent two distinct political-economic models in China and they embody different stages of economic development. They are thus *diverse cases* in our universe of provinces and help us illuminate the range of local applications of green funds as their investments are closely tied into the local economy (Gerring, 2008, pp. 650–652). In addition, the National Green Development Fund (NGDF), the largest and most significant green fund in China, was subjected to thorough investigation. NGDF represents the central government policymakers' ideas and ambitions for green funds, and as such sets the frame for local implementation.

Overall, the case funds highlight the role of government-sponsored green funds in mitigating market deficiencies in financing the transition through a strong focus on direct equity financing and co-financing of other local green equity (sub-)funds. The cases highlight how the application of local funds is closely woven into regional government development plans.

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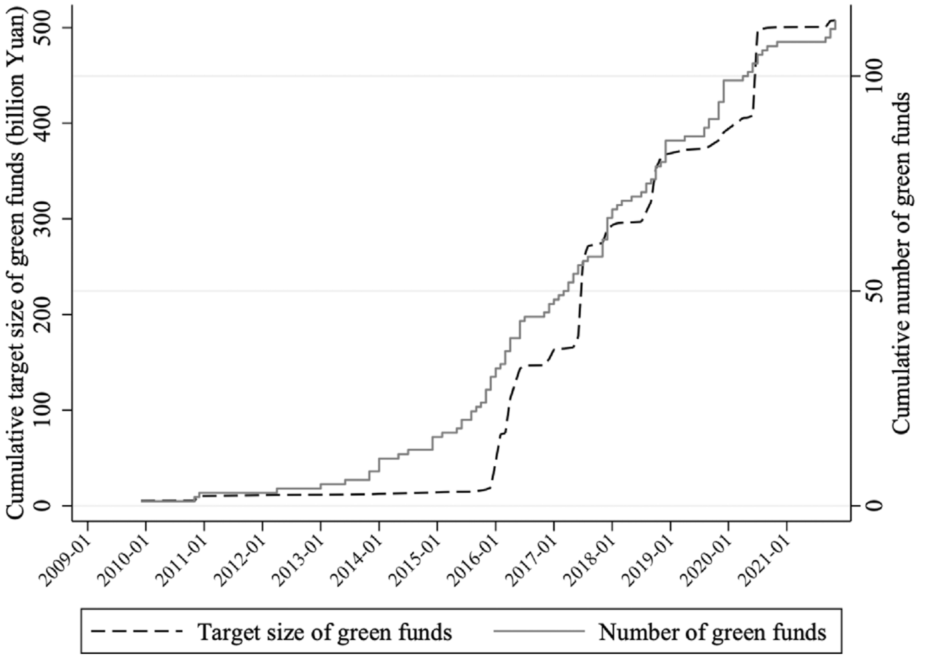

Figure 1 Target size and number of green funds, 2009–2021. *Source*: Authors' calculations are based on data from CVSource. See main text for the definition of “green funds” and search criteria.

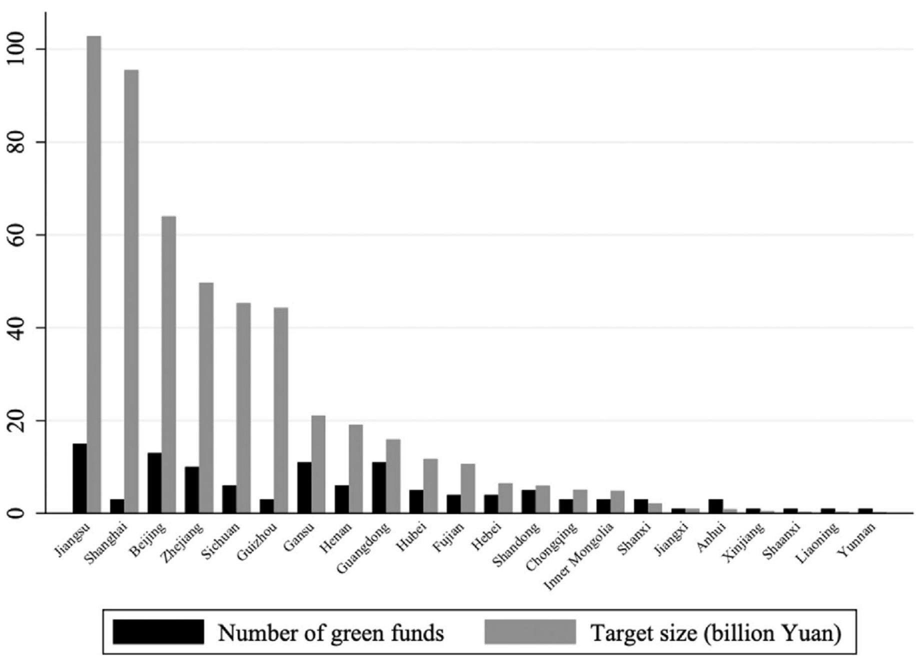

Figure 2 Provincial distribution of green funds. *Source*: Authors' calculations based on data from CVSource. Data updated December 2021. Location of registered headquarter shown; some national-level funds are headquartered in cities other than Beijing. See main text for the definition of “green funds” and search criteria.

The Jiangsu funds take a holistic approach by supporting traditional green industries such as solar, wind, or EV (see examples in Table 4), and also engaging in environmental protection broadly by, for example, upgrading and relocating polluting companies. The holistic approach supports the transformation and upgrading of Jiangsu

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as a nation-leading industrial base. On the other hand, Guizhou—a economically disadvantaged and rural province—uses a more targeted approach, with green funds indirectly supporting poverty alleviation efforts by investing into eco-tourism development, green transformation of agriculture and sustainable forestry, consequently with a lower emphasis on industrial development and traditional "green industries." All funds are organized in a two-tier mother–subfunds structure, with the NGDF also playing a coordinating role, with substantial co-financing of local government funds in addition to direct equity financing from the mother fund.

3.3.1. Policy background and organization

Guizhou is a predominantly rural, mountainous, ecologically fragile, and economically disadvantaged province in southwest China, accounting for around 1.8 percent of China's GDP. Since around 2016, the province has had a strong policy focus on utilizing green finance and green funds (Guizhou Provincial Government, 2022). In July 2017, Guizhou established a province-level committee for green financial innovation and development, signifying the importance of this policy area. Guizhou has established three main green funds with 44.3 billion Yuan in total target funding. We will focus on the 30 billion Yuan Guizhou Provincial Industrial State-owned Enterprise Green Development Fund (GISGDF) and the 13.8 billion Yuan Guizhou Green Industry Poverty Alleviation Investment Fund (GGPAF). Both funds follow a two-tier mother–subfund structure and incorporate various governance mechanisms such as fund management committees, expert committees, risk control committees, and audit institutions to ensure effective management. The same mother–subfunds structure is present in NGDF and JEEPDF.

Jiangsu is an affluent coastal manufacturing hub, accounting for approximately 10 percent of China's GDP. The province has been a standard-setter for local green policy plans and instruments in China and, from around 2011, adopted a series of green economy policies (UNEP, 2016). As of December 2021, the province had 15 green funds with a cumulative funding target of more than 100 billion Yuan. The largest and most influential green fund in Jiangsu is the Jiangsu Ecological Environmental Protection Development Fund (JEEPDF), established in 2017. The JEEPDF was initiated as a concrete policy instrument for implementing an environmental program called the "263" policy plan (CCP Jiangsu Committee, 2016; Jiangsu DEE, 2017). The JEEPDF has a target value of 80 billion Yuan and runs over 10 years. Six billion Yuan was raised and allocated to subfunds during the first round alone (JEEPDF, 2017). In 2018, the Jiangsu provincial government stressed how Jiangsu actively integrates green funds into regional development plans and upgrade its industries (Jiangsu DEE, 2018).

The concept of the National Green Development Fund (NGDF) was initially included in the Central Committee and State Council documents starting in 2017 (CCP, 2018; NGDF, 2023). In July 2020, the NGDF was jointly established by the Ministry of Finance, the Ministry of Ecology and Environment, and the Shanghai Municipal People's Government. The fund received co-investments from 26 core investors, including 11 provincial and city governments along the Yangtze River, with total target funding of 88.5 billion Yuan. The Ministry of Finance is the largest shareholder, with 11.30 percent of the shares. Additionally, major state-owned financial institutions contributed 57.5 billion Yuan, while some state-owned enterprises and a few private enterprises collectively contributed 2.4 billion Yuan (Ao, 2022). This setup is equivalent to other national-level government guidance funds, such as the 138.7 billion Yuan National Integrated Circuit Industry Investment Fund. The NGDF operates through two modes: direct equity financing and investments through various subfunds. The subfunds focus on energy conservation, environmental protection, utilization of energy resources, green transportation, clean energy, and other related industries. For example, NGDF has invested 1 billion Yuan in the Baowu Green Carbon Private Equity Investment Fund, a subfund that will invest in creating a more carbon-neutral iron and steel industry. Another example is its 180 million Yuan investment in a locally initiated green fund, the Yunnan Green Fund Equity Investment Partnership (Zhang, 2022).

3.3.2. Financing and project types

Guizhou's government-led, targeted-investment approach uses green funds to support poverty alleviation efforts and local economic development, for example, through greener agriculture, eco-tourism, ecological reserve management, or sustainable forestry. GGPAF has made direct equity investments in various Guizhou rural businesses, spanning agricultural products logistics, scenic tourist areas, and forestry and wood processing. Table 2 presents a selection of GGPAF's direct equity investments, highlighting the significant differences in operational modes between green funds and existing financing vehicles, such as loans from state-owned banks. For example, the

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Table 3 Selected direct equity investments from GGPAF

Investment target	Amount (million Yuan)	Investment date	Sector/Product
遵义遵投林业投资有限责任公司/Zunyi Zuntou Forestry Investment	659.2	13 May, 2020	Sustainable forestry, eco-tourism, and the construction of water conservancy and hydropower projects
毕节市农业发展集团有限公司/Bijie City Agricultural Development Group	391.3	3 November, 2020	Green agricultural development technology, low-carbon processing
贵阳市菜篮子集团有限公司/Guiyang Vegetable Basket Group	345	31 December, 2019	Planting and sales of agricultural products; crop cultivation services; wholesale and retail of fresh vegetables
贵阳农产品物流发展有限公司/Guiyang Agricultural Products Logistics Development Co.	194.2	15 July, 2020	Agricultural products wholesale market
铜仁水务集团有限公司/Tongren Water Affairs Group	80.4	31 December, 2022	Water conservancy, water affairs, municipal facilities construction, urban and rural water supply and drainage, sewage and wastewater treatment services
威宁彝族回族苗族自治县农业产业发展投资有限公司/Weining Yi Hui Miao Autonomous County Agricultural Industry Development Investment Co.	52.7	30 September, 2021	Agricultural and rural infrastructure construction
贵州织金文旅(集团)有限公司/Guizhou Zhijin Cultural Tourism Co.	45.9	31 December, 2019	Promotion and restoration of Zhijin town, a provincial-level historical and cultural town
贵州森茂林业开发有限责任公司/Guizhou Senmao Forestry Development Co.	37	30 December, 2022	Natural ecosystem protection and management; ecological reserve management services; ecological restoration and ecological protection services
紫云苗族布依族自治县水利工程投资建设有限责任公司/Ziyun Miao and Buyi Autonomous County Water Conservancy Engineering Investment and Construction Co.	26.1	30 December, 2022	Hydropower, water source and water ecological engineering, water conservancy tourism, reservoir risk relief and reinforcement, urban flood control, soil and water conservation

Source: Authors' compilation.

GGPAF bought a 32.3% private equity share in the newly established Zunyi Zuntou Forestry Investment worth 659.22 million Yuan (Zunyi Investment Group, 2021). This company controls 16 subsidiaries engaged in a wide range of activities within sustainable forestry, eco-tourism, and the construction of water conservancy and hydropower projects (Table 3).

Different from the Jiangsu funds and the central-level NGDF, the GISGDF in Guizhou selects its investment projects from the "fund investment project database" established by provincial authorities, as well as projects recommended by cities and prefectures. As such, the fund's initial project portfolio appears to be highly government-led and controlled, and not market-based (Zhang, 2021a). The government's influence in selecting investment targets is also evident from the fact that most equity investments by the other Guizhou fund, GGPAF, as listed in Table 2, are in SOEs. In Jiangsu, the targets are predominantly private companies or mixed-owned enterprises. Government intervention in Guizhou fund management also includes appointing fund managers, directly assigning personnel to manage the fund, leading the investment decision-making committee, defining the scope of fund investment, and even setting investment targets (Guizhou Provincial Government, 2022). The GISGDF has partnered with both local and central banks, which provide the funds with financing support of 110 billion Yuan to the enterprises in the fund's project portfolio.

JEEPDF in Jiangsu has three main subfunds: asset disposal, green industries, and facility upgrading. All subfunds are managed by the same professional management company. In addition to the "263" plan, these

Table 4 Examples of investments from Jiangsu green funds

Green fund	Investment target	Amount (million Yuan)	Date	Sector/product
南京雪浪金盈环保产业投资合伙企业/Nanjing Xuelang Jinying Environmental Protection Industry Investment Partnership	南京卓越环保科技有限公司/Nanjing Zhuoyue Environmental Protection Technology Co.	210.7	31 August, 2022	Environmental management industry, e.g., solid waste management; hazardous waste disposal, and environmental engineering technical consulting
江苏疌泉绿色产业股权投资基金/Jiangsu Binquan Green Industry Equity Investment Fund	江苏厚生新能源科技股份有限公司/Jiangsu Housheng New Energy Technology Co.	60.3	7 July, 2023	Lithium-ion batteries: key link related to clean energy, energy conservation, environmental protection, and efficient energy storage
	天合富家能源股份有限公司/Trina Power Co.	4.4	30 June, 2023	Solar power systems. Small and medium-sized distributed photovoltaic power generation market
	江苏为恒智能科技有限公司/Jiangsu Weiheng Intelligent Technology Co.	2.4	31 December, 2023	Battery energy storage solutions
江苏疌泉宽石生态园林产业基金/Jiangsu Bianquan Kuanshi Ecological Garden Industry Fund	南京冶山长辰工程有限公司/Nanjing Yeshan Changchen Engineering Co.	12.7	8 December, 2020	Geological disaster control engineering; mining and restoration engineering; environmental protection engineering; water conservancy and hydropower engineering
宜兴中禾节能环保创业投资企业/Yixing Zhonghe Energy Saving and Environmental Protection Venture Capital Enterprise	江苏宝安电缆股份有限公司/Jiangsu Baoan Cable Co.	10.7	23 September, 2023	Wire and cable manufacturing

Source: Authors' compilation.

functions feed into other policy plans such as supply-side structural reform and chemical industry transformation. The asset-disposal subfund takes private equity stakes in local enterprises and then reorganizes them. Green industry subfunds focus on developing enterprises within energy conservation, environmental protection, resource recycling, new energy, and resource conservation (EEC, 2020). This subfund has outlined plans to invest 6.7 billion Yuan in 74 projects. The large majority of these investments are allocated through subprovincial green funds. For example, through its stake in a Changzhou city-level fund, it has taken a majority stake in the Shuyang Jiangshen New Energy, a provider of biomass energy technical services and energy conservation management services. The Changzhou fund has also invested in Wuxi Jiangfeng Resource Recycling, which specializes in the collection, storage, disposal, and comprehensive utilization of hazardous waste. Finally, the facility-upgrading subfund takes private equity stakes in projects that upgrade industrial facilities to avoid pollution or clean up existing pollution. In addition to JEEPDF, Jiangsu has established several smaller government-owned green venture and growth funds. The selected investments of various sizes from some of these funds are listed in Table 3. They highlight a very different investment approach compared with Guizhou. In Jiangsu, the state equity investments are focused on more traditional green industrial companies, such as solar, hydropower, waste disposal, and batteries (Table 4).

NGDF engages in a combination of direct equity financing, green guarantee funds, and co-financing of local government funds. For example, NGDF recently signed an agreement with the Yangtze River Environmental

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Protection Group and the Yangtze River Environmental Protection Group Upstream, a subsidiary of the Three Gorges Corporation, to invest in the comprehensive management of the water environment in the upper reaches of the Yangtze River. NGDF has also invested in the construction of ecological restoration and wetland construction projects in Dali, Yunnan (Zhang, 2022) and the mother fund has led a second equity investment round for Avatr, the electric vehicle company, raising a total of 2.55 billion Yuan in new equity (NGDF, 2022).

In sum, the case study analysis reveals China's multipronged approach to green financing. Different provinces, based on their economic standing, existing industrial structure, specific challenges and opportunities, have tailored their green financing strategies. Meanwhile, at a national level, the NGDF underscores the country's holistic vision for a sustainable future and supports local funds. This nuanced, tiered approach suggests that China's green financing is not just a monolithic strategy but a layered, adaptable blueprint being implemented differently depending on the local political economy. The tailoring of the funds mandates to the local economic structure and political priorities, constitutes the "government-guided" or "state-led" element of the overall guiding framework of state-led financialization under a "market driven, government-guided" system. On the other hand, "market-driven" element is highly visible in the venture firm-like structure of the funds and their primary reliance on direct equity investments as the main financing tool. However, there are variations in the "market driven" aspect, that is, the different levels of government intervention, where we can observe that poorer less developed regions such as Guizhou exerting more direct control, while Jiangsu funds are more market driven in their investment selection and their governance. This pattern aligns with the country's broadly decentralized economic governance structure, which affords local authorities the latitude to innovate and experiment within the framework of national strategies and goals—here, the twin push for financialization and green transition.

4. Discussion: Using state-led financialization to enhance states' green investment capacity

The earlier analysis shows that state-led financialization has enhanced China's green state capacity in providing direct investment. The analysis suggest that China possesses several characteristics of a green state and, in particular, of a "green investor state." This new concept combines the state-led financialization in China as an "investor state" with the active use of the state in a green transition of a "green state." A green investor state possesses the investor-state characteristic of using public financial resources to steer the economy (Chen & Rithmire, 2020) and the (big) green state characteristic of actively interfering in the economy to drive a green transition (Gabor & Braun, 2023). The core contribution of this article is its demonstration that state-led financialization can enhance the provision of green state investment, particularly in terms of private equity stakes. This speaks to the debate in the green state literature on the political constraints to using various parts of the green state policy toolbox, and to the ongoing political debate on green industrial policy, such as in the United States and the EU. Doing so, the analysis presented here adds depth to the discussion of the range of organizational structures and tools that can be used to steer a green transition.

In exploring whether and how other countries can take a similar green investor state approach, our analysis highlights how Chinese state-led financialization constitutes a state-capital relationship that differs from Western experiences. The analysis clearly shows that the financial sector's power and interests are not obstacles to the state's policy maneuverability. This suggests that in China, state-led financializing does not result in a power transfer to financial institutions. This is arguably due to such institutions being under the direct ownership or control of the Chinese state. Comparing China to the sources of power identified in the West (Braun, 2020, 2021), Chinese banks do not gain independent private power because the largest are state-owned (Choi et al., 2020). Furthermore, a substantial proportion of asset management companies and all securities exchanges are state-owned as well. In addition, 85 percent of financing in China is in the form of loans from domestic banks (CEIC, 2021), while in the capital markets that make up the remaining 15 percent, only 3 percent of bonds and 4 percent of stocks are owned by foreign investors (Thornburg., 2021). In this way, the state's control of the financial system means that financialization does not change power dynamics away from the state.

Furthermore, the emergence of China's green investor state is happening in tandem with reforms that both financialize governance but also integrate the CCP further into the economy, such as through the institutionalization of CCP organizations in corporate governance and regulatory campaigns to ensure private sector support for political projects (Beck & Brødsgaard, 2022). Newly enhanced enterprise party committees are the firm- and

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fund-level steering instruments in China's green investor state. They ensure that the political green-transition goals are translated into action by SOE asset management firms and their government guidance funds. This dynamic is also at play in private Chinese companies. A recent study shows that investments by companies with CCP branches have a higher environmental and social performance (Zhou et al., 2021). This feature seems to be unique to China's green investor state in the context of China's party-state capitalism and would be difficult to apply directly in other countries.

Demonstrating the comparative implications of our findings, the analysis contributes to Gabor and Braun's (2023) conceptualization of green macrofinancial regimes. China's use of state finances to invest in a green transition does not conform to the derisking regime that dominates the West (Gabor & Braun, 2023), which argues that states are limited to provide guarantees, tax breaks, and concessional financing to green assets to attract private investors. Gabor and Braun (2023) argue that partially as a product of financialization, private global finance is a critical development partner for reaching Sustainable Development Goals and that states focus on constructing investible development assets and removing risks for private investors. We argue that China is taking a different path, closer to what Gabor and Braun (2023) label as the "big green state." The rapid increase in Chinese state-backed funds for green development documented here and the state's generally deep involvement in capital markets highlight that the green state in China is not limited by financialization and presents a much more ambitious state-building project that goes far beyond the derisking state in the macrofinancial regime.

In terms of generalizability, China's experience as an emerging green investor state is difficult to replicate outside state-capitalism countries as the approach is highly dependent on the state-led nature of China's financialization. Still, the rise of green industrial policy suggests that green funds are increasingly feasible elsewhere. For example, suggestions encompassing similar ideas of driving the green transition through state investment and asset holding have existed for years in the United States in the green new deal (Tienhaara, 2014) and Germany's push for renewables (Mazzucato, 2015b). Recent scholarship even identifies a "European investor state" (Lepont & Thiemann, 2024). Furthermore, recent scholarship suggests countries across the world are learning from China's innovative and pioneering green finance practices (Larsen, 2023). As part of the pushback against the neoliberal ideas of letting the market self-regulate and solve social problems, states are taking back the mantle and initiative, for example, on climate change. This is critical as current Western approaches rely on what Gabor and Braun (2023) label as derisking tools, which are useful for scaling up new technologies but do not provide adequate equity support to develop new technologies (Mazzucato, 2015a). As green funds can fill this equity investment gap, they are increasingly emphasized as an important part of proposed Western green industrial policy. Under such circumstances, it becomes conceptually relevant to understand how green investor states can arise and function in authoritarian and democratic regimes, developed and developing countries, and across socio-cultural models.

5. Conclusion

In this article, we have argued that state-led financialization enhances the Chinese state's ability to provide green state investment. This argument is supported by an analysis of China's state-backed green funds as a product of financialization that provides such green investment. Our analysis of policies in and around green funds yields our first conclusion: the funds play a central role in China's policy framework governing the greening of the economy. Second, from statistical analysis of green funds, we find that the scale of green funds has increased rapidly since 2016, and they are now a key financing component of China's green transition. Third, our three case studies document the functions and structuring of green funds in practice. We have argued that the approach is not directly replicable beyond state-capitalist economies, but that the gradual return of industrial policy elsewhere makes the use of similar funds increasingly feasible, warranting further research on the use of green funds in none-state-led types financialization.

From these findings, several streams of further research are needed to explore what Chinese green funds can tell us about Chinese governance as well as ideas in the academic fields around comparative capitalism and green transition. First, studying Chinese funds through in-depth case studies could test the findings of this article and provide greater certainty to our conclusions. This should include a comparison of green funds in different types of regional policy economies across China. Second, comparative studies of green funds in China and other

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countries could draw out characteristics that are uniquely Chinese and those which can be generalized internationally. Third, a lengthy discussion is warranted on what Chinese green funds can tell us about which tools green states have to drive a green transition. Ultimately, this article highlights the importance of considering the Chinese case in academic and policy-oriented discussions on how states can drive a green transition.

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Data availability statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Endnotes

[1] Interview with senior managers of the National Social Security Fund—Beijing, 2018.

[2] See Bäckstrand and Kronsell (2015, p. 7) for a discussion on how different definitions can be applied for analysis.

[3] The Chinese term used in the policies directly translates as "social capital" (*shehui ziben*) and includes both state-owned companies and private organizations.

[4] The 1 + N policy framework is also used, for example, in SOE reform (Zhang, 2019) and climate change policy (Carbon Brief, 2021).

[5] See Wang and Xu's (2020) book (in Chinese) for a comprehensive overview of national and local green finance and green fund policies.

[6] Interviews with officials from the Ministry of Ecology and Environment, the People's Bank of China, Jiangxi Province Finance Bureau, and Zhejiang Province Development and Reform Commission—Beijing, Jiujiang, and Ningbo, 2019.

[7] This role and these numbers were frequently mentioned in interviews and participant observation with researchers and policy makers in the People's Bank of China—Beijing, 2017–2020.

[8] Within these types, bank credit is the most important, making up roughly 80% of financing, with bonds at 15% (excluding local government bonds), and public equity at 5% (UNEP FI, 2018). Due to an increased need for COVID-19 stimulus spending, local government bonds made up 15 percent in 2021 (PBoC, 2022).

[9] This number is a conservative estimate since it has a restrictive definition only based on fund names. A report from the Hainan Green Finance Research Institute recently found 193 green funds within the broader categories of clean energy and environmental protection (HGFRI, 2021).

[10] Data from CVSource shows a total of 3,186 government guidance funds in China by December 2021. Naturally, other "nongreen" funds also pursue green investments. However, the exact extent of these investments are difficult to analyze due to lack of valid data.

[11] Interviews with officials from Ministry of Ecology and the Environment, local government Finance Bureaus, and a senior manager at a large investment bank—Beijing, 2019 and 2020.

[12] Interviews with provincial government officials in Jiangxi, Jiangsu, Shanghai, and Zhejiang. 2019.

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