Review of Radical Political Economics
1–20

DOI: 10.1177/04866134241284656
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Riding out the Storm: How State-Owned Enterprises in China Fought the COVID Crisis

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Abstract

The COVID-19 pandemic disrupted economic and social activities worldwide, exposing and exacerbating inherent flaws in the capitalist system. The pandemic's devastating impact highlights the need for the state and its institutional agencies to actively intervene in public health crises and mitigate the economic damage they cause. This article situates the effectiveness and contribution of state-owned enterprises (SOEs) in the context of the COVID crisis in China. It first examines how SOEs successfully mobilized their productive capacity at the beginning of the pandemic. Using empirical evidence from publicly listed companies, we then demonstrate how SOEs engaged in countercyclical investment when private investment collapsed. The evidence suggests that SOEs served as a crucial instrument in strengthening social and economic stability, which helped China ride out the COVID storm. We conclude that SOEs are vital for achieving stable social and economic performance in a neoliberal global economy.

JEL Classification: E11, O47, P31

Keywords

state-owned enterprises (SOEs), the COVID pandemic, social structure of accumulation (SSA), the Chinese economy

1. Introduction

The COVID pandemic disrupted economic and social activities worldwide, triggering the largest global economic crisis in more than a century (World Bank 2022). The pandemic's damaging impact underscores the need for the state to actively intervene in public health emergencies and mitigate their long-lasting effects. But, as critics have argued, the neoliberalization of the state in recent decades has weakened its ability to exercise command and control in an emergency (Navarro 2020; Andrew et al. 2020; Sparke and Williams 2022).

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Date received: September 8, 2023
Date accepted: September 3, 2024

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The pandemic prompted starkly different national responses in different countries. As is generally acknowledged, China effectively kept the number of infections under control in the early stages of the COVID pandemic (WHO Health Emergencies Programme 2023). Much attention has been paid to the strict, massive, and repeated lockdowns in Chinese cities and rural areas, but the fact that China maintained social and economic stability[1] during the crisis remains understudied. No matter how powerful China's state is, the lockdown policy could not be implemented for a long period unless sufficient medical services were provided to effectively resolve the major threat to people's health; meanwhile, essential economic activities needed to continue despite the pandemic and lockdowns. Evidently, in addition to the lockdowns, the state had to effectively mobilize medical supplies and stabilize the national economy.

It is this issue that we deal with here. In this article, we focus on the crucial role of state-owned enterprises (SOEs)[2] in China in helping the country to ride out the COVID storm. Specifically, we investigate how SOEs effectively responded to health and economic challenges, in ways that are distinct from the direct action of government and the private sector, by providing medical supplies and countercyclical investment. Connecting the analysis of SOEs to the literature on the social structure of accumulation (SSA) theory (Kotz, McDonough, and Reich 1994), we argue that SOEs in China are one of the essential parts of an alternative SSA that can survive in a neoliberalism-dominated global economy and deliver a better and more stable social and economic performance.

The massive SOE sector is an important feature of China's economic model. Despite privatization through the late 1990s and early 2000s, China has preserved major SOEs in important industries such as raw materials, energy, machinery, transportation, communication, utilities, pharmaceuticals, real estate, and financial services. China's SOEs serve as an important institutional legacy and indicator of an incomplete transition from the perspective of neoliberal economic theories, policies, and ideologies. The good performance of these enterprises has posed a serious challenge to neoliberalism.[3] The existing literature has extensively discussed the roles of these enterprises (Huang, Li, and Lotspeich 2010; Lo and Li 2011; Qi and Kotz 2020; Fang et al. 2023); nevertheless, that literature insufficiently analyzes and assesses the effectiveness and contribution of SOEs to the fight against exogenous shocks that pose major threats to social and economic stability. Examining how China's SOEs have helped in combatting the COVID pandemic and economic recovery adds to our understanding of this crucial economic institution and the opportunities it can provide.

The rest of the article is organized as follows. Section 2 discusses, first, the literature on policy responses to and preparedness for the pandemic, and second, the roles of SOEs in China. Section 3 analyzes how SOEs successfully mobilized sufficient medical supplies soon after the pandemic's outbreak. Section 4 provides empirical evidence that SOEs' countercyclical investment behavior sustained production and stabilized essential economic activities during the crisis. Extending the discussion, section 5 posits that SOEs are an essential institution for the SSA alternative to neoliberalism, and it emphasizes our findings' broader implications, especially for developing countries. Section 6 concludes the article.

[1]In this article, economic stability refers to sustained economic growth and the continuation of economic activities; social stability refers to the condition in which individuals feel secure in their lives, thus preventing societal chaos.

[2]In this article, SOEs refer to state-owned enterprises or state-holding corporations. SOEs do not include government institutions, public schools, or public hospitals. Private firms are almost equivalent to enterprises other than SOEs because collective-owned firms, which are neither state-owned nor private, constitute a negligible part of the economy.

[3]After privatization in the late 1990s, the productivity growth of SOEs, measured by total factor productivity, was faster than that of private firms from 1998 to 2007 (Hsieh and Song 2015).

2. Literature Review

Since the outbreak of the COVID crisis, a wide range of Non-pharmaceutical Intervention (NPI) policies and economic measures have been introduced by governments around the globe to combat the virus and stimulate the economy. Nevertheless, it is generally recognized that the world was significantly unprepared for the pandemic (and, unfortunately, remains ill-equipped for the next ones). The neoliberal hollowing out of effective state capacities, the dangerous diffusion of responsibilities, and de facto reliance on ad hoc emergency measures, as well as the absence of timely international coordination and cooperation, all account for the failure the world faced during the pandemic (Jones and Hameiri 2022; Weiss and Thurbon 2022; Mazzucato and Kattel 2020). The economic measures that governments struggled to undertake largely focused on providing liquidity to financial and nonfinancial businesses and/or state/local regional governments, encouraging credit creation by the financial sector, and directly funding households, businesses, and/or state/local/regional governments (Felipe and Fullwiler 2020).

However, tackling grand challenges requires strengthening the institutional capabilities of the state across different spheres of government (Mazzucato, Qobo, and Kattel 2021). These capability-building measures challenge the dominant neoliberal free-market ideology and go beyond conventional fiscal and monetary policy, particularly because COVID brought the global economy to a sudden stop. How quickly and to what extent national economies recover from such crises depends on how successfully the virus is contained and how the economy is stabilized and stimulated in an environment of uncertainty.

Many have argued that economic factors remain central even when the paramount objective is saving lives. The need to prepare for pandemics has been widely known for years; how much to invest in the necessary preparations is in part an economic decision (Michie 2020). The very first set of responses to a public health emergency lies in the mobilization and allocation of emergency medical supplies (personal protective equipment, ventilators, diagnostic tests, therapies, and vaccines) to ensure they are as safe, effective, and as affordable as possible. Prior to COVID, most countries did not have national stockpiles, nor did they anticipate the need (Kaliya-Perumal, Kharlukhi, and Omar 2020). Those countries that had existing reserves often found that they had insufficient types and quantities of emergency medical supplies, insufficient emergency production capacity, and imperfect command mechanisms for the deployment and transportation of emergency supplies (Wang et al. 2015, 2020). This is particularly true considering the rampant privatization process in neoliberalism. For example, the effectiveness of the Strategic National Stockpile (SNS) in the United States is heavily hindered by problematic government-business collaborations and financialization. William Lazonick and Matt Hopkins (2020) argue that business firms driven by maximizing shareholder value are proven unreliable partners in government-business collaborations upon which the development, production, and delivery of countermeasures are carried out, such as the provisioning of the SNS with innovative ventilators. Covidien and Philips, both financialized business corporations, acquired innovative ventilator businesses and diverted the profits of innovation away from product development and into the hands of shareholders in the form of stock buybacks and cash dividends, thus failing to deliver a single ventilator to the SNS from the beginning of the pandemic.

In contrast to many other exogenous shocks that typically have a more limited local or regional scope, the COVID crisis was a unique worldwide event. Its sheer scale, repeated waves, and the subsequent containment measures all substantially changed the business environment. A significant amount of fear and uncertainty has destroyed business confidence, causing the recovery to be extremely difficult, if not entirely unlikely. Both John Maynard Keynes (1936) and Michał Kalecki (1937), learning from the crisis of the 1930s, emphasized that investment in fixed capital primarily depends on a firm's demand expectations relative to its existing capacity and its ability to generate investment funding through internal cash flow and external financing. Uncertainty

increases the value of waiting for new information and retards the current rate of investment, contributing to the instability of aggregate investment over the business cycle (Bernanke 1983; Bloom, Bond, and Van Reenen 2007; Dangl and Wu 2016). How to offer sufficient and timely countercyclical investment and restore private sector confidence has always been a crucial issue when large-scale economic downturns occur.

Though the potential of SOEs to help combat crises such as the pandemic and promote development goals is widely recognized, the exact function and mechanism behind are less-than-fully articulated in mainstream economic reports (IMF 2020).[4] In the heterodox economics literature, and based on cross-country evidence, the role of SOEs has been intensely discussed as an effective tool to promote macroeconomic growth and stability (Doamekpor 1998; Cook and Uchida 2003; Zhu 2005). Regarding the empirical studies on SOEs in China, both Bai et al. (2000) and Huang, Li, and Lotspeich (2010) suggest that SOEs help maintain social stability by providing a social safety net to the unemployed or preventing massive unemployment. Qi and Kotz (2020) point out that SOEs play an outstanding pro-growth role in China by carrying out massive investments in economic downturns, investing in riskier areas of technology, and paying workers a living wage. Fang et al. (2023) document evidence that the cyclical quasi-fiscal investment of central and local SOEs in China exhibits expansion-biased investment behavior, particularly during the economic recession, which is key for the Chinese economy to quickly recover from recessions. Other studies also find that provinces with a higher investment share from SOEs tend to experience lower microeconomic instability, and investment by SOEs has a higher multiplier effect on GDP (Guo and Ma 2019). While we agree that SOEs can and do show macro efficiency generally, the COVID crisis differed from an economic recession in that the pandemic attacked the fundamental market infrastructures by interrupting or discouraging interactions between people. Thus, it is important to assess the contribution of SOEs against the backdrop of the global health emergency and subsequent economic downturn. In this respect, the empirical study conducted by Zeng and Tang (2023) finds that SOEs in the supply chains of private firms in China helped stabilize the cash flows of the corresponding private firms during the COVID period. In what follows, we provide a thorough analysis of the roles of SOEs in maintaining economic and social stability.

3. SOEs and Medical Supplies

Before discussing what SOEs did during the COVID crisis, we provide an overview of China's SOE system. This system was generally an institutional legacy of the SOE reform through the late 1990s and early 2000s, which mainly focused on three aspects. First, small and medium SOEs were privatized, and only large SOEs were preserved. Despite the large scale of privatization, the remaining SOEs have continued to grow and develop new branches. By 2019, SOEs as a whole (excluding state-holding[5] financial institutions) employed 31 million people and held assets valued at 48 trillion yuan (or 7 trillion USD) (SASAC 2021). In the industrial sector (mining, manufacturing, and utilities), SOEs accounted for 40 percent of assets, 23 percent of revenue, and 26 percent of profits (NBS 2020). Second, during the reform, the vast majority of remaining SOEs were restructured as stock-holding companies, whose shareholders included not only state owners but also private ones. By 2019, SOEs existing in the form of stock-holding companies accounted for 95 percent of employment in the whole SOE sector (SASAC 2021). Many of these companies are publicly listed in stock markets across the globe. Third, the Chinese government

[4]In an interesting transition in recent years, much of the economic literature has moved from blaming SOEs for inefficiency to highlighting SOEs as remedies for market failures. The transition is closely related to the good performance of SOEs in the areas of innovation, efficiency, and profitability.

[5]State-holding companies are enterprises where central or local governments hold a controlling share.

established the State-owned Assets Supervision and Administration Commission (SASAC) that, by participating in the corporate governance of state-holding companies, represents and defends the interests of state owners. The SASAC consisted at the central and local levels of supervising "central SOEs" and "local SOEs," respectively. Central SOEs (98 in total in 2023) are the largest companies in China; 46 of them are among the top 500 largest companies in the world (SASAC 2023a). Local SOEs on average are smaller, but as a whole, they account for 73 percent of SOE assets and 58 percent of SOE employment (SASAC 2021). In the early stages of the pandemic, both central and local SOEs were widely engaged in the provisioning of medical supplies, utilities, and logistics services.

To treat and contain infections in a pandemic, sufficient medical supplies are crucial. Some countries have established stockpiles of medical supplies for public health emergencies. For instance, the SNS in the United States was established in 2002, as a response to the 9/11 attacks. The US federal government devotes $600 million each year to maintaining the SNS. As of February 2022, the SNS held a reserve of personal protective equipment (PPE) including 747 million N95 respirators and 274 million surgical/face masks (US Department of Health and Human Services 2022). Compared with the SNS, China's national stockpile of medical supplies, established as early as in the 1970s, is still relatively small. Nevertheless, it played an important role in fighting natural disasters and epidemics such as the 2003 SARS epidemic, the 2008 Wenchuan earthquake, and the 2009 H1N1 epidemic. The stockpile is funded by the central government and operated by Sinopharm and Meheco, two central SOEs in the pharmaceutical sector. Since the late 1990s, provincial governments in China also have established stockpiles at the local level, operated either by local SOEs or large private companies.

Despite the efforts to establish national and local stockpiles, China confronted a serious shortage of medical supplies in the early stage of the pandemic. The shortage reflected the fact that the national stockpile was underprepared for the explosion of demand for PPE. The supply and demand of PPE in Hubei Province, the epicenter of the pandemic outbreak, kept a "tight balance" from late January to mid-February in 2020. Reporting on January 25 indicates that the national stockpile deployed 14,000 protective coveralls and 110,000 pairs of medical gloves (Xinhuanet 2020). In addition, the national stockpile carried out an urgent procurement of masks, protective coveralls, and goggles, implying that the reserves had been depleted.[6] By the end of January, the daily demand for protective coveralls soared to 100,000, and it soon doubled as increasingly more medical workers were sent to Hubei. However, only 15 percent of the demand could then be met by China's daily productive capacity (SCIO 2020). In April, when the virus's spread was brought under control, the state loosened the lockdown policy, which triggered a massive shortage of masks.

China resolved the shortage problem by temporarily establishing a quasi-planning economy in which central SOEs played a crucial role. We describe the response as a quasi-planning economy because government departments actively mobilized, coordinated, and supervised the SOEs and private firms that produced the needed medical supplies. Two powerful departments of China's central government, the Ministry of Industry and Information Technologies (MIIT) and the National Development and Reform Commission (NDRC), coordinated the production of PPE. Official coordinators, deployed to key productive firms, resolved all problems that constrained production—problems that ranged from mobilizing raw materials and workers to promoting new technologies that could substantially accelerate the production of PPE. These firms

[6]Ding Xiangyang, the Deputy Secretary-General of the State Council of China, commented on the shortage: "When the central guiding team arrived in Wuhan (the capital of Hubei Province), we found that medical supplies, especially protective suits, were in a serious shortage. . . as I remember, the daily demand of protective suits was 50,000, but the supply was only 10,000." (SCIO 2020)

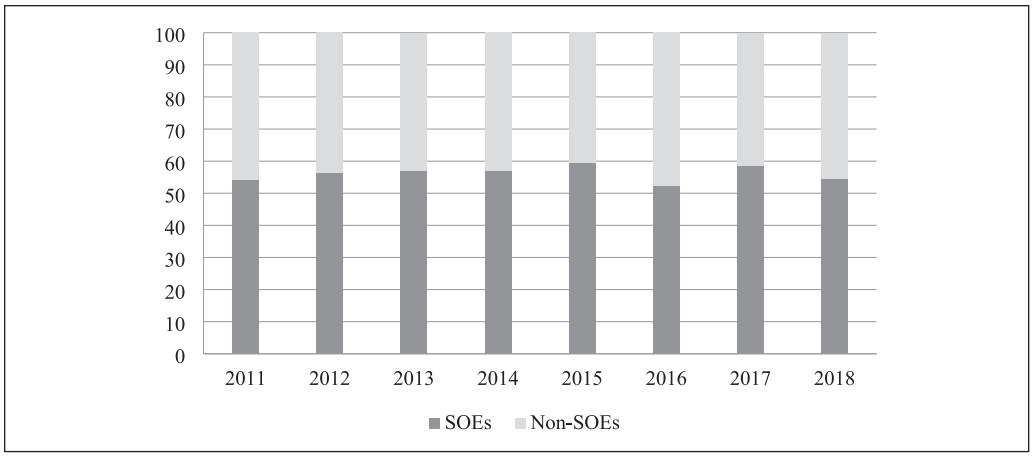

Figure 1. Share of business income by ownership in the "pharmaceutical distribution" sector, 2011–2018.
Source: Statistical Reports on Pharmaceutical Circulation Industry, Ministry of Commerce in China. 2011–2018.
Note: "Pharmaceutical distribution" refers to the pharmaceutical supply chain that connect manufacturers to end users, including hospitals and patients. Enterprises specializing in this sector are involved in the storage, transportation, wholesale, and retail of pharmaceutical products. It is important to note that this sector is a subset of the broader pharmaceutical industry, encompassing both distribution and manufacturing activities. It is also noteworthy that large pharmaceutical enterprises, whether SOEs or non-SOEs, typically participate in both manufacturing and distribution activities.

were required to report their output statistics each day. The government purchased all the products produced by these firms and distributed them to the locations where they were needed. Thanks to the quasi-planning economy, the shortage problem was resolved in less than three weeks. The daily production of protective coveralls for use in Hubei Province rose to 250,000, covering all the demand there (NHC 2020b). On February 25, the daily production of N95 respirators surpassed the demand from medical workers in Hubei (NHC 2020a).

This quasi-planning economy would be impossible without the participation of SOEs. The government purchased the PPE products of the key firms through the national stockpile system operated by the central SOEs in the pharmaceutical sector—an arrangement that ensured that the transport and distribution of PPE products was timely and efficient. Despite the massive privatization of the late 1990s, SOEs continue to dominate the most important sectors of the economy by controlling key resources, technologies, or distribution.[7] The pharmaceutical industry, given its paramount importance to people's lives, is a sector where SOEs still control a dominant share of market access. Figure 1 shows the dominance of SOEs in the pharmaceutical industry with their shares in the "pharmaceutical distribution" sector.[8]

[7]SOEs play a crucial role in major technical innovations, as shown by Qi and Kotz (2020). According to NBS (2023), in terms of revenue, SOEs account for 58 percent of coal, 78 percent of petroleum and natural gas, 40 percent of ferrous metal ores, 44 percent of nonferrous metal ores, 36 percent of automobiles, and 55 percent of railway, ship, aerospace, and other transport equipment.

[8]"Pharmaceutical distribution," as commonly categorized in Chinese official reports, refers to the pharmaceutical supply chain that connects manufacturers to end-users, including hospitals and patients. We specifically emphasize the significance of this sector because it directly interfaces with end-users, ensuring timely access to essential pharmaceutical products, particularly during a pandemic. It is noteworthy that, despite SOEs' dominant share in the "pharmaceutical distribution" sector, private firms are influential in the whole pharmaceutical sector, especially in the pharmaceutical manufacturing sector where SOEs only account for 11 percent of revenue.

SOEs also directly participated in the production of PPE by quickly transforming companies' production lines. For example, Jihua Group, an SOE that focuses on the manufacturing of military bedding and clothing, and which had no experience producing PPE, was required by China's state council to build a productive capacity of 40,000 protective coveralls by February 14, 2020. Jihua Group completed the task within 9 days. By late February, Jihua Group's daily production of protective coveralls accounted for one-third of the national output (SASAC 2020a).

In some cases, SOEs participated indirectly in the production of PPE. For instance, China Petroleum & Chemical Corporation (Sinopec), an energy and chemical state-owned giant, significantly increased its productive capacity of melt-blown fabric, a crucial raw material used to manufacture surgical masks. Although the technological barrier to producing surgical masks is low, the lack of melt-blown fabric was the main bottleneck in the expansion of the productive capacity for surgical masks. The production of melt-blown fabric is highly capital-intensive, requiring special equipment, facilities, and training for workers. Equipment for high-quality products needs to be imported. Thus, it usually takes two or three months to build a production line of melt-blown fabric. Private firms could expand their production capacity of surgical masks, but they hesitated to invest in new production lines of melt-blown fabric because they did not know when the pandemic would end and whether their investments would be profitable. Consequently, there was a serious shortage of melt-blown fabric, which caused a surge in its price. To resolve the shortage and price surge, the SASAC urged Sinopec to build new production lines. With the assistance of Sinomach, another machinery-building central SOE, Sinopec doubled its productive capacity within two weeks. In 76 days, Sinopec built a productive capacity for melt-blown fabric that could support the production of 13.5 billion surgical masks annually. As Sinopec expanded its capacity, 95 percent of the production lines became domestically made, demonstrating the strong technological capability of SOEs (SASAC 2020b).

The medical capacity expanded at the early stage of the pandemic and was maintained during the following two years, to defend against recurring domestic infections and export medical products to other countries. Consequently, China did not face a serious shortage of medical supply after the sudden relaxation of restrictions at the end of 2022, except in a few regions and for certain kinds of medicines. SOEs played a crucial stabilizing role during this period once again. For instance, Sinopharm, the largest pharmaceutical enterprise in China, tripled its output of antipyretic and cough medicines, while stabilizing the price through the efficient logistics and distribution process. With the support of SOEs, China swiftly recovered after the abrupt relaxation of restrictions. By February 2023, China's medical supplies were fully capable of meeting the demand for treatment (NHC 2023).

Why are SOEs irreplaceable for increasing the output of medical supplies in the early stages of a pandemic? Why in a market economy do profit incentives not encourage private firms to do the same? The answer to these questions lies in the goals and capacities of SOEs. After the outbreak of COVID-19, the surge in the market demand for PPE could be satisfied only by investments in new production lines. However, both SOEs and private enterprises were not certain when the pandemic would end or whether market demand would continue to surge. Thus, investments in the early stage of the pandemic were highly risky. Moreover, the expansion of productive capacity required labor power and raw materials, both of which could be undersupplied due to the pandemic and lockdown policies. The PPE products are technologically simple; however, manufacturing PPE requires inputs from an upstream chemical industry that is largely capital- and technology-intensive. Moreover, new investments in the industry tend to be highly risky. As a result, in an economy dominated by private firms whose primary goal is the pursuit of profits, the upstream industry will be short of investments, while the downstream industry will be short of supply, causing rampant price gouging or market fraud as well as speculation and inflation.

In contrast to private firms, SOEs pursue multifaceted objectives that vary depending on the context. On the one hand, SOEs engage in market competition within certain sectors, where

profit generation is a primary goal. On the other hand, in critical areas or during emergencies such as natural disasters and epidemics, SOEs prioritize social objectives, including the stabilization of supplies, containment of inflation, and maintenance of economic security (SASAC 2023b). This duality in objectives allows SOEs, particularly in the context of the COVID pandemic, to undertake high-risk, low-profit ventures. The profits accumulated in normal times enable SOEs to pursue social goals in emergencies. Moreover, SOEs present a strategic advantage by providing the government with a streamlined method to facilitate intercompany cooperation more effectively. The majority of SOEs are situated in upstream industries that produce machinery and essential raw materials, many of which are general purpose and versatile across various production processes, including the development of new products. The deeply rooted traditions of innovation, established procedures, and robust organizational structures within these industries, augmented by inter-SOE collaboration, empower SOEs to overcome technological challenges during emergencies like the pandemic.

4. SOEs and Countercyclical Investments

The pandemic and stringent COVID controls led to an economic recession. In a capitalist economy dominated by private companies, an exogenous shock like the pandemic can easily prolong a recession. One of the crucial factors is the lack of private investment due to massive uncertainty. COVID-related construction activities had to be suspended, and the labor force was largely in quarantine, leading to disappearing market demand and a nearly zero return on investment. Even when the pandemic was waning, private investment remained stagnant as companies still confronted the uncertain timing of the next wave and subsequent policy responses. Just as investment from one company generates demand for other companies, an entire economy can easily fall into a market demand–investment downward spiral.

In China, investment is an ultra-important source of aggregate demand: it was as high as 43 percent in 2019, and private investment continues to dominate total investments, accounting for 57 percent of the total (NBS 2020). The slowdown in private investment has had a serious impact on the national economy. Clearly, the health of the population is paramount, and saving lives must come first. But sustaining economic activities remains important when lives are at stake. The disruption could induce more unemployment or rising employment precarity, an increase in poverty, a lack of access to sufficient medical resources, and, through a deterioration in physical and mental health, a rise in suicides, and so on. Such conditions can eventually further deteriorate the population's health. Therefore, stabilizing investment to restore growth and employment is not merely an economic policy goal; it also serves as a necessary condition if society as a whole is to recover from the pandemic.

The countercyclical investment of SOEs is a vital tool that allows China to stabilize investment. SOEs and private companies both operate under market competition for profits. What makes a difference in China is the fact that the state serves as the controlling stockholder of SOEs and thus the behavior of SOEs reflects the goal of this stockholder. Therefore, SOEs coevally fill two roles: as ordinary market players under normal economic conditions; and as a tool for economic stabilization during economic downturns. When aggregate demand is inadequate, SOEs can raise investment to improve it directly; moreover, SOEs can purchase products from private companies, creating market demand for those products and stimulating investment in them; thus, SOEs indirectly increase aggregate demand. The countercyclical investment provides a new macroeconomic stabilizer beyond the reach of traditional fiscal and monetary policies.

The government can undoubtedly stabilize the economy through fiscal and monetary policies. However, these policies have a limited impact on investment, as corporate investment remains sluggish, affecting the recovery of demand. In contrast, SOEs act as investment engines that directly influence investment demand. Additionally, SOEs can borrow money from banks, raise

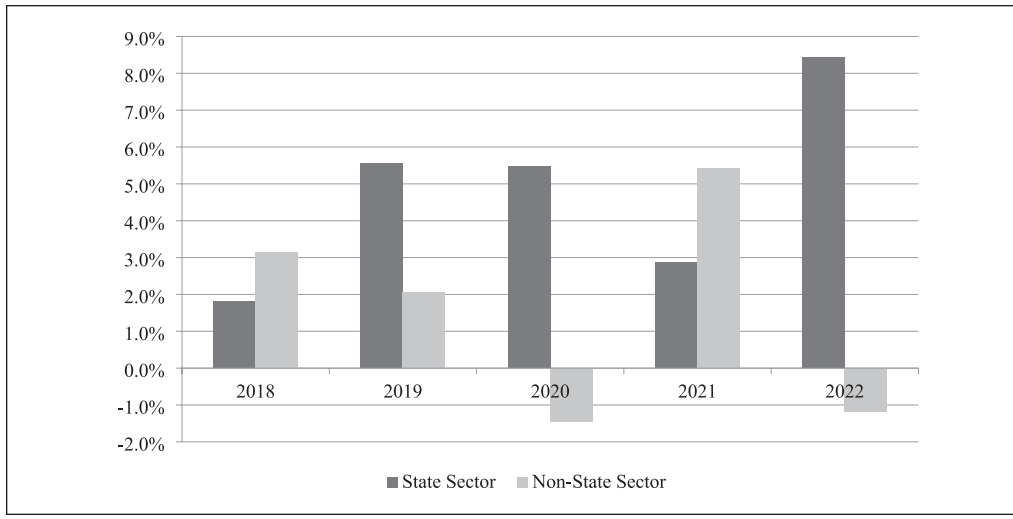

Figure 2. The growth rates of investment in fixed assets.
Source: China Statistical Yearbook, 2018–2022.
Note: The investment from the state sector includes investment in fixed assets from SOEs and other investments from non-enterprise state units, such as government departments, public universities, and public hospitals. The investment from the nonstate sector includes investment in fixed assets from non-SOEs and other investments from non-enterprise, nonstate units.

funds from the stock market, and utilize their own funds for investment, thereby more effectively mobilizing an economic surplus that would otherwise have no better outlets, as well as enhancing the government's ability to intervene in the economy. SOEs can also invest in existing and strategic emerging industries, serving the short-term objective of stabilizing the macroeconomy and the long-term objective of industrial restructuring. To maintain themselves as market players, SOEs have to manage newly invested assets and seek a stable profit model to provide guarantees for financing and investing, thus reproducing and reinforcing itself as a macroeconomic stabilizer. [9]

Figure 2 illustrates the growth rates of investments from the state sector and nonstate sector from 2018 to 2022, adjusted for changes in the price level. As shown in figure 2, in 2020, the year when the pandemic hit the economy and strict lockdowns were initially implemented, investment from the nonstate sector dropped by 1.5 percent, while the state sector raised investment by 5.5 percent, matching the growth rate of the previous year. Despite the sudden pandemic-induced disruption, particularly during the first two quarters of 2020, state-sector investment continued to grow until 2021, when investment from the nonstate sector began to recover. During the Omicron wave when stringent pandemic control policies were reinstated, state-sector investment rose again to counter the uncertainty affecting the nonstate sector.

The annual macroeconomic data reveal countercyclical state-sector investment as a whole during the pandemic years. The evidence, however, is not sufficiently strong because of the

[9]Countercyclical investment may jeopardize the sustainability of SOEs. Given that banks in China tend to favor lending to SOEs, there is a risk that SOEs could become overleveraged as a result of debt-financed countercyclical investment. The government may also support SOEs through increased loans, fiscal subsidies, and other interventions. This phenomenon, often referred to as a "soft budget constraint," has been extensively discussed in the literature (Kornai 1979; Lin, Liu, and Zhang 2004), although such constraint is not necessarily linked to public ownership. Therefore, it is important to emphasize that the countercyclical investments from SOEs are not unlimited, despite expanding the government's capacity for macroeconomic regulation.

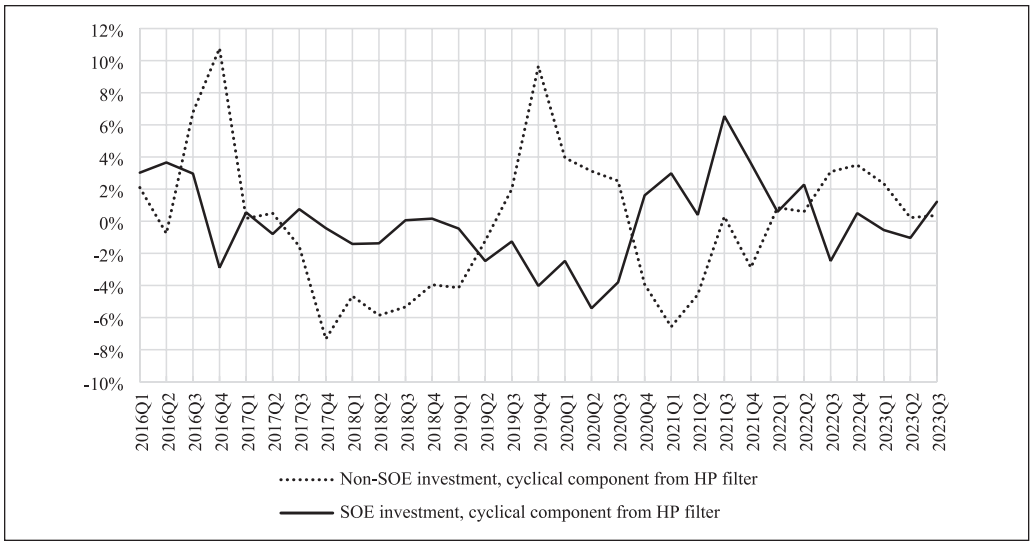

Figure 3. Cyclical components of SOE and non-SOE investment.
Source: China Stock Market & Accounting Research Database (CSMAR).
Note: Using the CSMAR firm-level data, we compute the growth rate of fixed capital stock (I/K) for each SOE. Subsequently, we calculate a provincial average, which is a weighted mean based on the capital stocks of all SOEs within the province. For each quarter, we take the simple average of these growth rates across all provinces to derive the national growth rate of fixed capital stock for SOEs. Similarly, we apply the same methodology to calculate the national growth rate of fixed capital stock for non-SOEs. The cyclical components based on these averages for SOEs and non-SOEs across all provinces are then calculated using the Hodrick Prescott filter (Hodrick and Prescott 1997). The results reflect the gaps between the growth rates and their long-term trends.

absence of quarterly and monthly investment data. Macro-level state-sector data also include investment from non-enterprise state units, such as government departments, public universities, and public hospitals. Furthermore, a more accurate measure of firm-level investment is the growth rate of fixed assets, compared to the growth rate of investment.

To more accurately capture the stabilizing effect of SOEs during the pandemic, we further employ quarterly data from publicly listed companies collected in the China Stock Market & Accounting Research Database (CSMAR). This data set only includes enterprise data, which helps exclude non-enterprise state units. It also contains detailed financial measures for listed companies. These enterprise data enable a focused analysis of the economic activities of SOEs, specifically excluding investments by non-enterprise state units, such as hospital construction, which is unrelated to countercyclical investments. Moreover, this data set facilitates a meaningful comparison between SOEs and private enterprises, ensuring a like-for-like comparison of economic activities.[10]

We use the year-on-year growth rate of fixed assets to measure investment behavior. Figure 3 presents the quarterly fluctuations in the growth of fixed assets of SOEs and non-SOEs from 2016 through 2023. Here's how we generate observations: Using the CSMAR firm-level data, we compute the growth rate of fixed capital stock (I/K) for each SOE. Subsequently, we calculate a provincial average, which is a weighted mean based on the capital stocks of all SOEs within the province. Similarly, we apply the same methodology to calculate the provincial average for

[10]Despite these advantages, China Stock Market & Accounting Research Database's (CSMAR's) list of companies accounts for just a small share of all enterprises in China. The data of many medium- and small-sized enterprises are not included in the data set.

non-SOEs. For each quarter, we take the simple average of these growth rates across all provinces to derive the national growth rate of fixed capital stock for SOEs. The cyclical components based on these averages for SOEs and non-SOEs across all provinces are then calculated using the Hodrick Prescott filter (Hodrick and Prescott 1997). These components reflect the gaps between the growth rates and their long-term trends.

As presented in figure 3, the growth rate for SOEs was lower than its long-term trend (cyclical component below zero) in the first quarters of 2020 at the beginning of the pandemic, while for non-SOEs it was higher than its long-term trend (cyclical component above zero). Nevertheless, both declined during the pandemic until the fourth quarter of 2020.[11] During 2020Q4 and 2021Q1, the growth rates of the capital stock for SOEs became higher than their long-term trend, while those for non-SOEs fell behind the long-term trend. Also during this period, the growth rates for SOEs rose and those for non-SOEs fell, reflecting the fact that non-SOEs kept their investment low because of the pandemic. The growing investment in SOEs offset the sluggish investment demand of non-SOEs. Since the third quarter of 2021, non-SOEs and SOEs have recovered to their long-term level. The fluctuations in the growth rates for SOEs and non-SOEs presented in figure 3 indicate that SOEs carried out countercyclical investments in 2020Q4 and 2021Q2. After the sudden relaxation of restrictions in the fourth quarter of 2022, the growth rates for both SOEs and non-SOEs declined but soon began to recover in the second quarter of 2023, indicating the impact of infections was diminishing.

The COVID pandemic created an exogenous shock to all enterprises on a global scale. Because all enterprises were exposed to the treatment, no one can serve as a fundamental control group. Nevertheless, because the goal of the study is to identify the investment behavior of SOEs during the pandemic, relative to non-SOEs, we employ the difference-in-difference (DID) estimation, using SOEs as the treatment group and non-SOEs as the control group, based on the following equation:

$$\left(\frac{I}{K}\right)_{i.t} = \beta_0 + \beta_1(SOE_{i,t} * Post_{i,t}) + \lambda_i + \mu_t + \varepsilon_{i,t} \quad (1)$$

where i and t indicate province and quarter (2019Q4 to 2021Q2). Each province-level growth rate of capital stock is weighted by the level of their fixed capital stocks. SOE equals 1 for the treatment group (SOEs) and 0 for the control group (non-SOEs), and Post equals 1 if the time is 2020Q4 or later and 0 if otherwise. Notice that we take the fourth quarter of 2020, rather than the breakout of the pandemic (2019Q4 or 2020Q1), as the beginning of the "shock" because this is the quarter when SOEs began to respond. When the pandemic initially hit and lockdowns were implemented, both SOEs and non-SOEs were exposed to sudden disruption, leaving SOEs with no capability to carry out countercyclical investment. During the fourth quarter of 2020, did the continuous decline in investment from non-SOEs raise serious concerns for the state, at which point, SOEs intervened in the economy through the use of countercyclical investment.[12]

The coefficient β_1 gives us the DID estimator, which estimates the difference in the investment between SOEs and non-SOEs after the pandemic. To improve the baseline DID estimates from

[11]It is noteworthy that, in theory, SOE investment is not consistently countercyclical. When private investment remains within normal levels, SOEs may not need to stabilize overall investment. Conversely, if private investment deviates from normal levels but SOEs are unable to invest, for instance, because of factors like the shock of COVID-19, SOE investment may decline as well. The COVID-19 shock from 2019Q4 to 2020Q3 caused both SOE and non-SOE investments to decrease.

[12]In October 2020, the fifth plenary session of the 19th Central Committee of the Communist Party of China (CPC) confirmed the short-term and long-term objectives for the national economic and social development in the next five years and the next fifteen years. The committee stressed the role of SOEs in providing countercyclical investments to stabilize the economy (Xinhua News Agency 2020).

Table 1. Summary Statistics.

Variable	Definition	Obs	Mean	Std. Dev.
I/K	Annual growth rate of fixed assets	425	0.113	0.207
SOE × Post	SOE = 1 for state-owned enterprises, otherwise 0; Post = 1 for periods from 2020Q4 to 2021Q2, otherwise 0	425	0.209	0.407
Profit rate	Net profits/fixed assets	425	0.135	0.154
Capacity utilization	Operating income/fixed assets	425	2.058	2.364
Borrowing cost	Financial cost/debt	425	0.010	0.013
Financial rate of return	(Nonoperating income − nonoperating expense)/ financial assets	425	0.001	0.007
Financial asset ratio	Financial assets/total assets	425	0.143	0.059
Debt ratio	Debt/total assets	425	0.523	0.127
Age	Log of firm age	425	3.033	0.120
Size	Log of total assets	425	22.663	0.727

Source: China Stock Market & Accounting Research Database. Obs = observations; SOE = state-owned enterprise.
Note: The table presents the statistics of the dependent and independent variables used in the econometric analysis. The summary statistics in the table are for the overall sample, including SOE groups and non-SOE groups. Since there is no direct indicator to measure the capacity utilization of Chinese enterprises, and the existing literature has yet to achieve a consensus on the measure of it (Fan et al. 2019), we follow the definition from Davis (2018), which measures the capacity utilization as a ratio between operating income and fixed assets.

model 1, we include control variables to reduce potential omitted variable bias. Following the investment equation developed by Davis (2018), we also consider investment as a function of the current and desired stocks of capital, financial assets, and debt. Thus, we employ the following covariates as controls: profit rate, capacity utilization, borrowing cost, financial rate of return, financial asset ratio, debt ratio, firm age, and size. We add the province fixed effects, λ_i, to control for time-invariant confounders specific to each province, such as demographics, industrial structure, economic background, and cultural/political spectrum. We include the quarter fixed effect, μ_t, to control for national time trends for national macroeconomic conditions, national holidays, and the common pandemic timeline that affected all provinces, including economic relief by the central government. Table 1 lists the definitions and descriptive statistics of all variables in the model.

Table 2 presents the results from the baseline DID estimation for investment. Both the models without control variables (1) and with control variables (2) estimate β_1 as significantly positive at the 1 percent level, confirming that SOEs displayed countercyclical investment behavior during the pandemic, as we expected.

The DID results may be driven not by the pandemic but by systematic differences in treatment (SOEs) and control groups (non-SOEs). Thus, the key assumption for the DID estimator is that the treatment and control groups had parallel trends in investment growth before the pandemic. Although the counterfactual (What would have happened to the outcome variables for the treatment group if the pandemic had not occurred?) is unobservable, we can examine the trends in outcome variables for both groups before the pandemic and determine whether the two groups are indeed comparable. Using an event-study approach, we examine whether the parallel trends assumption is likely to hold.

Figure 4 presents the results of testing the parallel-trend assumption of the DID estimation for quarterly investment, using the event-study approach. A plot of the estimated coefficients shows the result is close to zero, indicating that the pretreatment trend for investment is constant for the SOEs and non-SOEs, providing evidence that the parallel-trend assumption is likely to be

Table 2. Baseline Results.

	(1)	(2)
	I/K	I/K
SOE × Post	.158***	.140***
	(.056)	(.05)
Unit fixed effect	Y	Y
Period fixed effect	Y	Y
Controls	N	Y
Observations	425	425
R-squared	.104	.143

Note: Standard errors are in parentheses. SOEs = state-owned enterprises.
***$p < .01$.
The firm-level data are aggregated at the provincial level. For each province, we have a treatment unit (SOEs group) and a control unit (non-SOEs group). Because of missing data points, the overall sample size in the DID estimation is 425.

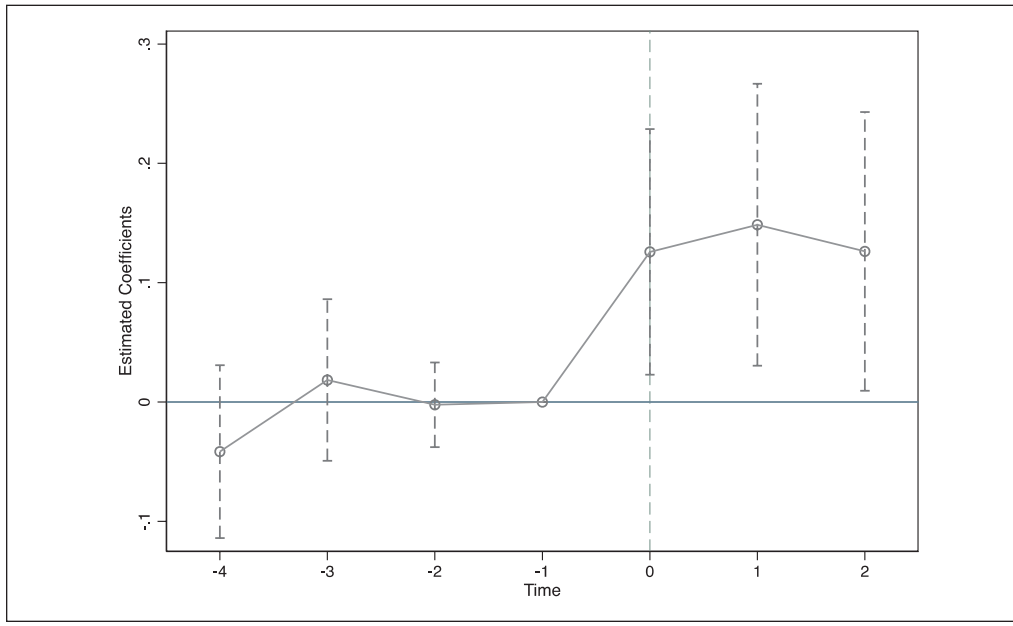

Figure 4. Parallel trend test.
Note: In the four quarters before the outbreak of the pandemic (2019Q4–2020Q3), the estimated coefficients were not significantly different from zero at the 1% significance level, indicating compliance with the assumption of the parallel trends. During the pandemic period (2020Q4) and the two periods following the shock (2021Q1–2021Q2), the estimated coefficients were significantly greater than zero at the 1% significance level, indicating a significant increase in investment by SOEs relative to non-SOEs after the pandemic shock.

satisfied. During the pandemic and the immediate two quarters afterward, the trend for investment from SOEs departed from the one for investment from non-SOEs.

The state is more likely to rely on large SOEs to carry out countercyclical investments because medium- and small-sized enterprises have relatively weaker capacities. We categorize enterprises into large (the top 25 percent), medium (the middle 50 percent), and small (the bottom 25 percent) based on the level of total assets. Regression results presented in table 3 confirm that the DID estimates are significant for large enterprises, but not for small and medium ones.

Table 3. Regression Results for Small Firms, Medium Firms, and Large Firms.

	Small firms		Medium firms		Large firms	
	(1)	(2)	(3)	(4)	(5)	(6)
	I/K	I/K	I/K	I/K	I/K	I/K
SOE × Post	.076	.017	.048	.025	.157**	.169***
	(.106)	(.067)	(.053)	(.041)	(.062)	(.059)
Unit fixed effect	Y	Y	Y	Y	Y	Y
Period fixed effect	Y	Y	Y	Y	Y	Y
Controls	N	Y	N	Y	N	Y
Observations	262	257	383	383	368	368
R-squared	.05	.258	.027	.134	.095	.12

Note: Standard errors are in parentheses. SOEs = state-owned enterprises.
*** $p < .01$, ** $p < .05$.
The firms are categorized based on their levels of total assets (the bottom 25% for small firms, the middle 50% for medium firms, and the top 25% for large firms). Integrated to a provincial level data, the size of each subsample should be the same as the whole sample (425) but is less due to missing observations.

Table 4. Regression Results for Least-Affected, Moderately Affected, and Most-Affected Firms.

	Least-affected firms		Moderately affected firms		Most-affected firms	
	(1)	(2)	(3)	(4)	(5)	(6)
	I/K	I/K	I/K	I/K	I/K	I/K
SOE × Post	.241**	.211**	.023	.033	.104	.156
	(.093)	(.085)	(.039)	(.033)	(.095)	(.104)
Unit fixed effect	Y	Y	Y	Y	Y	Y
Period fixed effect	Y	Y	Y	Y	Y	Y
Controls	N	Y	N	Y	N	Y
Observations	243	243	126	126	56	56
R-squared	.157	.19	.044	.196	.273	.433

Note: Standard errors are in parentheses. SOEs = state-owned enterprises.
** $p < .05$.
The firms are categorized based on the number of COVID infections in the province where they are located, so the sum of the three subsamples' sizes in the province-level data is equal to the size of the overall sample.

When enterprises were seriously exposed to the pandemic, even SOEs were not able to invest because all economic activities were largely disrupted. We categorize enterprises into most heavily impacted (the top 25 percent), moderately impacted (the middle 50 percent), and least impacted (the bottom 25 percent) based on the number of COVID infections in the region where the enterprises are located. Regression results presented in table 4 confirm that the DID estimates are significant for enterprises that were categorized as least affected, but not for those heavily or moderately affected by the pandemic.

5. Discussion: SOEs as a Key Institution for the Social Structure of Accumulation

As we discussed above in detail, SOEs have clear advantages over private enterprises: In emergencies like a pandemic, the production of essential products, such as melt-blown fabric and

masks, often necessitates collaboration between companies. However, the pandemic severed these vital connections, rendering government coordination indispensable. SOEs present a strategic advantage by providing the government with a streamlined method to facilitate intercompany cooperation more effectively. Producing essential products during a pandemic typically involves significant risks, and many crucial products, like vaccines, demand corporate innovation. Private enterprises, driven by profit motives, are often risk averse. In contrast, SOEs, bolstered by government support, are more inclined to undertake innovative activities despite the inherent risks. Products required during a pandemic possess public good attributes—the cheaper they are, the greater the societal benefit. Private enterprises might hoard these products for profit. Moreover, in emergencies, market prices can be distorted by panic and information asymmetry (Cohen and van der Meulen Rodgers 2020). SOEs, motivated by public interest, are more likely to produce and price products to better meet societal needs.

While at the same time, compared to government intervention, such as government procurement, SOEs also have clear advantages: The government can address the demand for essential products through fiscal orders but cannot deeply embed itself in the production process or coordinate between companies. When the government places orders, private enterprises might face various obstacles, such as a lack of raw material suppliers, skilled workers, or critical technologies. The presence of SOEs can alleviate these challenges. The government can impose legal price limits to prevent hoarding, but enacting such laws often encounters significant political resistance from private enterprises. Additionally, these price controls can result in supply shortages. Only through SOEs, which oversee production, can a stable supply and prices be maintained. While government can certainly use fiscal and monetary measures to stabilize the economy, these policies often have a limited impact on investment. SOEs, as investment engines, can directly influence investment demand. Moreover, SOEs can, via a variety of channels, enhance the government's capacity to intervene in the economy.

Our assessment of SOEs during the pandemic contributes to the existing literature on the role of SOEs in economic development, particularly for China, and to the emerging literature that interrogates and criticizes current neoliberal capitalism and moves forward by proposing possible alternatives. We argue that the efficacy of SOEs as a macroeconomic stabilizer, showcased during the COVID-19 pandemic, underscores the indispensable role of robust institutions needed to reinstate social and economic stability and foster capital accumulation.

One of the most important theoretical innovations in heterodox economics is the SSA theory. An SSA is a set of institutions that underpin fast and stable capital accumulation in a country. In the post–World War II era, the United States experienced two SSAs, the regulated SSA and the neoliberal SSA. While the former highlights the state's regulations of the macroeconomy and essential sectors as well as a capital-labor social accord, the latter deregulates essential sectors and substantially undermines the power of workers. Regarding economic growth, the neoliberal SSA has performed significantly worse than the regulated SSA with sluggish economic growth, higher unemployment, rising inequality, lower resilience, and more frequent financial bubbles and crises (Kotz, McDonough, and Reich 1994; McDonough, Reich, and Kotz 2010). The unstable macroeconomic environment and diminished bargaining power of labor have led to increasingly precarious working conditions during the neoliberal era. The COVID pandemic was an exogenous shock to the US economy; however, the economic and social impacts of the pandemic have been aggravated by the sluggish job growth and precarious conditions characteristic of the neoliberal SSA. As previously discussed, neoliberal policies, marked by privatization, outsourcing, and deregulation, have impeded the state's capacity to efficiently coordinate public resources and collaborate with private firms in responding to the pandemic.

Given the performance of the neoliberal SSA during the past four decades and the COVID period in particular, it is important to ask whether alternative institutions and SSAs can survive the neoliberalism-dominated global economy and deliver better economic and social performance.

One of the stylized facts about China's economic growth is that it achieved relatively fast and stable economic growth over four decades, which substantially contributed to social reproduction through massive job creation and significant wage growth. The growth was not interrupted by the 1997 Asian financial crisis or the 2008 global financial and economic crisis, nor was it interrupted by SARS or COVID. Despite a slowdown in economic growth since 2012, China's level of growth has still been significantly higher and more stable than growth in most major economies. In 2020, when China achieved 2.2 percent growth, most major economies were experiencing a recession caused by the pandemic (NBS 2020; World Bank 2024). This relatively fast and stable economic growth can be largely attributed to investments, which serve as the major source of aggregate demand in China.

We argue that SOEs in China represent a key institution for a non-neoliberal SSA, which not only stabilizes the economy through countercyclical investments but also ensures the production of essential goods in emergencies. The stability provided by SOEs encourages the capital accumulation of private firms, maintains the aggregate demand, and, thus, promotes overall economic growth. Although SOEs are a distinct feature of the Chinese economic model, the fundamental logic of these firms may provide policy implications for other large developing countries that seek a stable development path in such an unstable neoliberalism-dominated global economy.

Firms like China's SOEs can play dual roles in three dimensions. First, these firms are both economic and political in the sense that they are autonomous economic organizations that deeply connect with the political goals of the state. This implies that the state firmly controls these enterprises, not in the same way that the state controls a government department but in the way shareholders govern a corporation. Second, these firms are both profit-seeking and public-oriented, depending on the context. On the one hand, developing countries tend to need these firms to gain a competitive edge in the global market, which requires these firms to seek and accumulate profits. On the other hand, these firms should prioritize public needs over profits in emergencies, which requires a smooth transition in the goals of firms when an emergency occurs. Third, these firms are both market players and planning executors and so they, too, are contingent on context. When the market does not function well, these firms can implement planned production, purchases, and investments to remedy market failures. The dual roles of these firms substantially challenge neoliberal economic theories, policies, and ideologies. SOEs in China provide strong evidence that firms that play these dual roles are not only possible but can also be effective.

6. Conclusion

The COVID pandemic threatened the health of the world's population and strained the global economy. As each nation rushed to save lives and stimulate the economy, the responses reflected the limitations of the current system and the inability of current institutional arrangements to effectively provide medical resources and stabilize the economy. Like Keynes's conclusion from the crisis of the 1930s, this outcome urgently calls for new ways of thinking about the economy, particularly new effective interventions beyond traditional fiscal and monetary policies.

Our research examines the impact of the COVID pandemic on investment behavior in China and illustrates how SOEs serve as a crucial instrument that mobilizes medical resources and stimulates investment, thus helping the country ride out the storm. Based on macroeconomic and firm-level data, we employ the DID estimation and event study design, using SOEs as the treatment group and non-SOEs as the control group, to identify the effect of the COVID pandemic on investment. We find that compared with non-SOEs, SOEs had a considerably higher level of investment growth during the pandemic. The results are significant for large enterprises and for those that were least affected by the pandemic.

Our findings further suggest that SOEs, which stabilize the economy, restore growth, and safeguard people's interests, are an essential institution of a non-neoliberal SSA. Outside of

China—and particularly in large developing countries that seek a stable development path—SOEs should be regarded both economically and politically as a key alternative to neoliberalism. Where SOEs do not mobilize countercyclical investment, market failure is doomed to be the norm, leaving ordinary people in health and economic precarity.

Acknowledgments

We would like to thank Jeff Powell, Mehrene Larudee, the anonymous referee, Enid Arvidson, and Yana van der Meulen Rodgers for their invaluable feedback and suggestions, which significantly enhanced earlier drafts of this article. We have no conflicts of interest to declare.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

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