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China's Pseudo-monetary Policy*

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Abstract. China's monetary stimulation after the global financial crisis rapidly boosted its GDP. We argue that its efficacy derives from state control over its banking and corporate sectors. Beijing ordered state-owned banks to lend and they lent. Beijing ordered centrally-controlled state-owned enterprises (SOEs) to invest and they invested. Our data show much of this investment was highly leveraged purchases of real estate and land prices rises occurred where these SOEs were active buyers. This episode mimics the credit channel for monetary policy, but actually entails internal transfers between arms of the government pressuring on real estate prices upwards.

JEL Classification: E52, G28, G38, O23, R30

1. Introduction

China's response to the 2008 global financial crisis seems a textbook example of the efficacy of monetary policy. The government boosted annualized real money supply (M2) growth rate from 14.9% in 2008 Q4 to 26.2% in 2009 Q1, and then 30.4% in 2009 Q2. The annualized real growth rate in total loan balances rose from 13.1% to 27.9% and then 33.9% in the same intervals. The annualized real growth rate in fixed capital asset investment rose from 20.3% in 2008 Q4 to 29.4% in 2009 Q1, and then 38.0% in 2009 Q2, contributing for over 90% (a historic peak) of China's GDP growth in

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2009.[1] This is consistent with a sharp monetary expansion expanding credit, thereby boosting capital spending.

However, closer inspection reveals the transmission mechanism at work here is based on the ruling party's effective control of the careers of the executives in state-owned enterprises (SOEs). China's major banks are state-owned, as are its largest nonfinancial corporations. Their CEOs' careers are dependent on accounting performance and on serving the Communist Party of China (CPC). The CPC, in the wake of the financial crisis, exhorted banks to lend and firms to invest. Large SOE banks responded enthusiastically, and dramatically increased their lending. But, presumably to display harmony with CPC policy yet avoid bad loans tainting their accounting returns, SOE bankers lent mainly to "safe" borrowers—large nonfinancial SOEs. Large nonfinancial SOEs likewise responded enthusiastically, dramatically increasing their borrowing. CEOs of these large nonfinancial SOEs used the loans mainly to invest in real estate which, unlike factories, R&D, or technology, can generate observable short-term profit. Real estate purchases, moreover, immediately boost reported capital spending, but can be undone with a simple transaction, avoiding the need for costly and time-consuming capital budgeting analysis.

This "command and control" channel for monetary policy is clearly effective in the official statistics: China boosted capital spending, and thus GDP. But this seeming efficacy may come at a real cost. Transaction-level land auction regressions show prices rising sharply in response to bids by centrally controlled SOEs, which exceed all other bids by an average of 16%. This surge in real estate investment transformed large numbers of SOEs from all manner of other sectors into inexperienced property developers holding huge portfolios of potentially overvalued land and real estate properties, rendered convenient housing unaffordable to substantial fractions of the country's population by nearly doubling housing prices in major cities, potentially crowded out investment in other sectors, and allowed local governments to accumulate unsustainable debts by using notionally valued land holdings as collateral.

The article proceeds as follows. The next section summarizes the institutional background of banks, most of which are SOEs, and nonfinancial SOEs in China, including various reforms and their current status. Section 3 discusses the stimulus policy—the actions by the central government and roles of bank and nonfinancial SOEs in the transmission of the policy—it argues that the SOE channel is important to Chinese macroeconomic policy. Section 4 introduces the land transaction data for empirical tests, and section

[1] Source: National Bureau of Statistics, "*Statistics Yearbook of China*".

5 discusses our empirical results linking SOEs' bidding to real estate prices. Section 6 discusses the social and economic implications of SOEs' bidding behavior in land market. Section 7 concludes.

2. Institutional Background on Banks and Large Nonfinancial Enterprises

2.1 RECENT SOE REFORM POLICIES

Since the founding of the People's Republic of China in 1949, or more precisely, since the completion of its "Socialist Transformation" in 1956, SOEs' domination in all industrial sectors has been a key element of Socialism. From 1956 until the recent reform era, industrial facilities were parts of various government ministries, and thus integral parts of the central, provincial, municipal, or local district governments. Managers were appointed government bureaucrats charged with following Central Plans and occasional direct orders from higher levels of government or Party officials.[2] In 1978, when economic reforms began, SOEs accounted for 78% of total industrial output and 64% of urban employment, and during 1975–80 still accounted for over 84% of new investment in industrial fixed assets (Chiu and Lewis, 2006; Brandt, Rawski, and Sutton, 2008).[3]

After the mid-1980s, reforming SOEs became a major policy focus, and actual reforms occurred in three phases. The first phase, from the mid-1980s to the mid-1990s, expanded SOE autonomy and surrounded their CEOs with incentives. First, a "dual-track approach" (*shuang gui zhi*) let SOEs produce beyond their quotas, sell the excess at market prices, and keep the proceeds of this as corporate profits, while the government continued setting quotas. Later, a "contract responsibility system" (*cheng bao zhi*) was introduced for most small- and medium-size SOEs, under which their managers signed contracts with the government. These gave managers considerable autonomy in running their SOEs, but the enterprises remained wholly owned by the State. Profits were shared between the enterprises and the State according to the contracts.

The second phase of SOE reforms started in 1994 and focused on ownership. Guided by the slogan "grasp the big, let go the small" (*zhua da fang xiao*), the government designated many small- and medium-size SOEs for

[2] For more details about SOEs during the planned economy era, see Chiu and Lewis (2006) and Brandt, Rawski, and Sutton (2008).

[3] Most of the remaining was by collectives, which by definition were owned jointly by all members in a neighborhood or village, but in most cases also controlled by local governments.

reorganization, closure, debt write-offs, merger into partnerships, leasing, contractual operation, or sales. Larger SOEs remained state-owned as a shareholding system was introduced. Some more profitable enterprises were even encouraged to list minority public floats on domestic or international stock exchanges.[4]

Our focus here is the third phase of reforms which established the foundations for SOEs' role in the government's stimulus packages. The third phase began in November 2002, following the 16th National Congress of the CPC. The government set about reforming property rights and corporate governance in large SOEs. One key reform was the formation of a set of State-owned Assets Supervision and Administration Commissions (SASACs) in March 2003 by the State Council of the People's Republic, China's analog of the Privy Council in a Westminster system of government.

The powers and responsibilities of the SASACs were defined in a May 2003 State Council document entitled "Interim Provisions on Supervision and Administration of State-owned Assets of Enterprises" (Decree 378, 2003), and an amended version of which became the 2008 Law on State-owned Assets of Enterprises. This assigned SASACs the legal liabilities and rights of investors holding SOE shares on behalf of the State and the responsibility of guiding and supervising further SOE reforms.

As Panel A in Figure 1 shows, the State Council SASAC is a ministry of the central government in Beijing, and serves as a holding company for SOEs that were formerly part of the central government. These are called "central SOEs" (*yang qi*), hereinafter C-SOEs. At its founding in 2003, the State Council SASAC had charge over 196 C-SOEs. Mergers over subsequent years reduced their number to 142 by the end of 2008, and 129 by the end of 2009. The State Council SASAC is also charged with guiding and supervising the regional-level SASACs, which control other SOEs that were formerly parts of provincial, city, or district governments: "local SOEs" (*di fang guo qi*), hereinafter L-SOEs.

The SASAC reforms "corporatized" SOEs into entities recognizable as joint stock companies, with shares bestowing ownership rights and governance structures regulated by Corporate Law, Securities Law, and other bodies of law and regulation. These so-called "modern enterprise system" (*xian dai qi ye zhi du*) reforms fundamentally changed SOEs in several ways.

First, the SOEs became legal entities with owners. This was accomplished by recasting plants, factories, etc. as corporate entities owned by government organs, in most cases the government ministries or administrative agencies

[4] For more detail about the first two phases, see reviews in, for example, Qian (2000), Chiu and Lewis (2006), or Brandt, Rawski, and Sutton (2008).

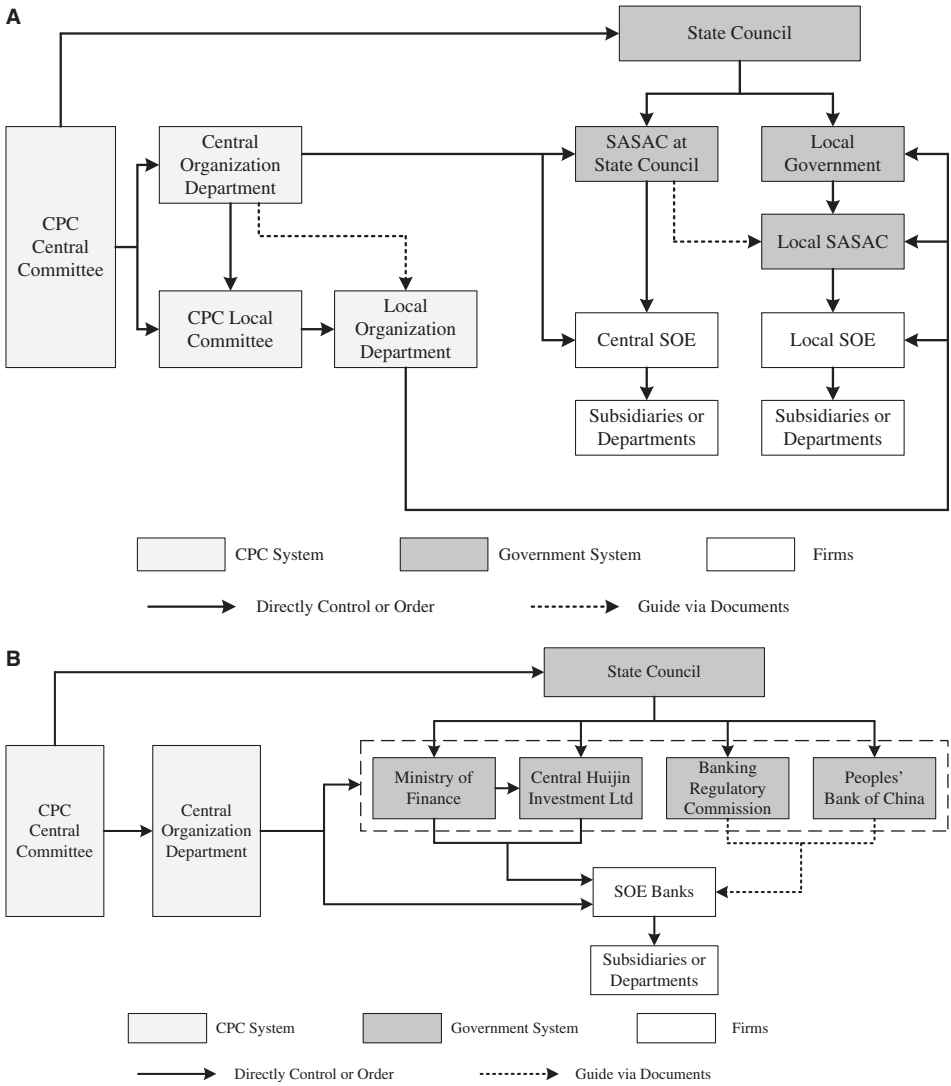

Figure 1. Structure of SASAC institutions and state-owned banks. (A) SASAC institutions. China's roughly 300 SASACs include the SASAC of the State Council, which supervises SOEs controlled by the national government; about thirty province-level SASACs, which supervise provincially controlled SOEs; and numerous municipal SASACs, which supervise locally controlled SOEs. Top SOE executives are hired, renewed, and dismissed by the SASACs, and also require approval from the Organization Departments of CPC. (B) State-owned banks. The major shareholders in SOE banks are the Ministry of Finance and the Central Huijin Investment Ltd, the latter is a C-SOE. The SOE banks' businesses are guided by both the Banking Regulatory Commission and People's Banks of China. Like their counterparts in the nonfinancial sector, top executives of the SOE banks are appointed by the Central Organization Department of CPC.

under which they previously operated. This necessitated the clarification of the property rights of both the SOEs and their shareholders. State assets formerly used by several SOEs had to be assigned to one SOE or divided cleanly among more than one. Because all shareholders in an SOE, including the SASACs, were thenceforth to have identical rights, the final ownership structure—the fractions of shares in each SOE owned by various ministries, government organs, and levels of government had to be clarified so these could be assigned to the corresponding SASACs. Thereafter, a firm in China is officially classified as state-owned or state-controlled only if the State, by dint of one and only one SASAC or parent SOE, is its sole owner or ultimate controller.

Second, the reforms gave SOE managers meaningful autonomy over day-to-day business decisions. Before the SASAC reforms, all SOEs were integral parts of national, provincial, or local governments. By recasting SOEs into distinct entities, the reforms severed direct bureaucratic control over SOE operations. Moreover, Premier Jiabao Wen promised at the founding of the State Council SASAC that the SASACs would not become SOEs' "mothers-in-law" (*po po*)—a Chinese term connoting overbearing meddling.

Nonetheless, the SASACs' equity blocks gave them strong control rights over SOEs, with which they were to fulfill their fourfold supervision and administration roles. First, the SASACs were expected to affect top management decisions by using their equity blocks to control SOE boards. Second, the SASACs, especially the State Council SASAC, were empowered to issue regulations and documents that SOEs had to obey regarding development strategies, investment decisions, budgets, audits, risk management processes, and so on.[5] Third, the SASACs were empowered to define, and redefine, each SOE's primary business activity. SOE executives thus need prior SASAC approval for a shift in primary focus from one line of business to another, though not to acquire control of a subsidiary in another sector. Finally and most importantly, as Panel A of Figure 1 shows, top SOE executives were thenceforth hired, renewed, and dismissed by the SASACs, though top appointments in C-SOEs also required approval from the Organization Department of CPC. The top positions that also require Party approval include the chair of the board, CEO, deputy CEO, and any other key position the CPC Organization Department considers important. Most recently, the "Interim Provisions on Management of Executives in C-SOEs", issued jointly by the CPC Organization Department and the State

[5] A 2008 State Council SASAC document entitled "Development of SASACs in the Past Five Years" reports that the State Council SASAC issued 19 regulations and 104 documents from 2003 to 2008, while local SASACs issued over 1,600 documents during that period.

Council in December, 2009, enshrines the principle of "absolute control of the executives by the Party" (*dang guan gan bu*). Consistent with its incontestable control of the economy's "commanding heights", the Party thus retains direct control over SOEs by dint of directly controlling their top executives' careers.

This leads directly into the third important feature of the new system: SASACs control over SOE top executives' incentives. The State Council assigns SASACs the responsibility to "evaluate the executives of the enterprises through legal procedures, and grant rewards or punishments according to their performance".[6] The SASACs consider this one of their major instruments for "improving" SOE performance. One of the first Documents the State Council SASAC issued after its 2003 founding was the "Interim Provisions on Performance Evaluations for Executives of C-SOEs". Revised twice, in 2006 and again in 2009, this Document mandates that State Council SASAC conducts annual and triennial evaluations of C-SOE top executives for use in determining the executives' compensations.

The Document divides an executive's compensation into a "base salary", typically about one-third of the total, and a "bonus", the remaining roughly two-thirds. Following the 2006 amendments, listed C-SOEs could also grant their top executives shares as a third component of compensation, though few do so as yet. The State Council SASAC reports the average annual salary, including both base salary and bonus, of C-SOE CEOs rising from RMB 350,000 in 2004 to about RMB 600,000 in 2009, a level considerably above that of top ministry-level civil servants in the central government.[7]

In theory, this directly links the income of a C-SOE's top executives to its performance. The SASAC assigns the executive a grade, with A the highest and E the lowest, in his SASAC annual evaluation. An A means a triple bonus, while an E means no bonus at all. Sixty percent of the bonus is paid immediately after the annual evaluation, while the remainder is held in abeyance until the end of the executive's term of office, typically 3 years, and disbursed completely only if the executive gets at least a C grade in the triennial evaluation.[8] In both evaluations, the SASAC is to gauge the performance of the SOE under the executive's stewardship in terms of absolute profits, economic value added (EVA), appreciation in asset valuations, and annualized revenue growth rates in the SOE's primary line of

[6] Source: "Interim Provisions on Supervision and Administration of State-owned Assets of Enterprises" (State Council's Decree 378, 2003).

[7] Source: speech by Mr Rongrong Li, director of State Council SASAC on January 9, 2010.

[8] See the latest version of "Interim Provisions on Performance Evaluations for Executives of C-SOEs" (State Council SASAC Document 22, 2009) for more details.

business. CEOs of the relatively few listed SOEs are also evaluated on share price performance.

The grades an SOE executive attains also affect his subsequent career path. But, as noted above, the SASAC only makes recommendations regarding SOE executives' promotions at their triennial evaluations. The Organization Department of the CPC actually decides to promote, demote, or laterally transfer the executive to his next position, which is seldom with the same SOE (McGregor, 2010). Rather, SOE executives' next positions are typically at other SOEs or in government bureaucracies or Party organs. The Organization Department of the CPC ranks all government, Party, and SOE positions so that promotions, demotions, and lateral transfers can be clearly defined.

This subjects top executives to a loyalty test: career success depends on adherence to CPC policies and harmonious cooperation advancing CPC priorities, or perhaps more accurately, obedience to senior government and Party officials' explicit or implicit orders. A top SOE executive judged unresponsive to such direction risks not being promoted, or even being demoted at the end of his 3-year term ends—even if his SOEs performs well. Kato and Lang (2006), Bai and Xu (2005), Firth, Fung, and Rui (2006), Zhao, Yang, and Bai (2007) find top executive turnovers in listed Chinese SOEs significantly less related to ROA, ROS, and other performance indicators than in other listed firms.

The SASAC reforms are problematic for two reasons. First, the reforms seemingly give SOE top executives greater autonomy by excising them from the bureaucratic chain of command within a ministry. However, SOE executives' career prospects still depend on decisions by the Organization Department of the CPC, which is charged with ensuring loyalty to Party and government policies. Second, the reforms explicitly link SOE executive bonuses to quantitatively measurable SOE financial performance indicators: profits, EVA, asset value appreciation, and revenue growth. (These are supplemented by share values in only a handful of listed SOEs.) However, all four primary financial indicators measure short-term performance, and SOE executives' bonuses and promotions depend on three annual evaluations and one triennial evaluation by the relevant SASAC. In almost all cases, 3 years of good performance locks in the executive's bonuses and justifies a promotion by the CPC Organization Department to a higher position in a government bureaucracy or a different SOE. Policies that artificially inflated short-term performance and create future problems are someone else's problem.

In summary, the reforms sever SOE executives from the ministries that formerly contained them, but preserve the Party's incontestable control over

SOE executives' careers. The reforms tie SOE executive bonuses to SOE financial performance measures, but only to measures of short-term performance. The overall effect of the reforms on the efficiency of resource allocation is thus, at best, ambiguous.

These dual criteria for evaluating SOE top executives—deliver profits and serve the Party—can align if, as Deng Xiaoping proclaimed, "to be rich is glorious" (*zhi fu guang rong*). But if Party priorities shift away from this, SOE performance and loyalty may conflict; and SOE top executives must balance dual objectives: augmenting corporate performance for the sake of their near-term compensation, but obeying government directives to protect their longer term careers.

The balance in such cases is almost certainly strongly tilted toward obedience to government directives, for the Organization Department of the CPC remains overwhelmingly important to advancing or blocking SOE executives' careers at all levels. Risking the Organization Department's displeasure by defying political directives to protect an SOE's financial bottom line would likely appeal to few ambitious managers.

China's recent stimulus package took effect within this context. Top executives of SOE banks and nonfinancial SOEs obeyed government orders to lend and to invest, respectively, but did so in ways that minimized damage to their SOEs' near-term profitability. Specifically, SOE bank executives lent, not to private entrepreneurs, but to nonfinancial SOEs because the latter were unlikely to fail in a macroeconomic downturn. SOEs invested not in productivity-enhancing corporate assets, but in real estate. We posit that this response explains the speed and scale of the stimulus package's impact. To the extent that the stimulus successfully corrected a market failure, this may well benefit macroeconomic performance. But if SOE executives' responses to the stimulus misallocated the economy's savings, its longer term performance may be compromised.

2.2 CURRENT STATUS OF SOES

To play a major role in effecting the central government's macroeconomic stimulus, SOEs must be an economically significant part of the economy. Despite the ongoing reorganization and privatization of small- and medium-sized SOEs, which has caused a steady decline in the number of SOEs over the past decade, SOEs retain the commanding heights of the Chinese economy.

The past three censuses by National Bureau of Statistics in China (Table I) show the number of SOEs, financial, and nonfinancial, falling from 369,000 (12.19% of all enterprises) in 2001 to 192,000 (5.91%) in 2004, and then

Table I. Thousands of enterprises, by control category

Note: According to the definition of National Bureau of Statistics, China, "state owned enterprises" refer to enterprises which the State (i.e., certain SASAC or SOE) is the only owner or ultimate controller; "collective enterprises" refer to enterprises jointed-owned by a certain group of people (such as village or neighborhood); "other joint-stock enterprises" refer to joint-stock enterprises without any single SASAC or SOE as the dominant shareholder; "private enterprises" refer to enterprises owned by certain person; and "foreign-funded enterprises" refer to enterprises owned or controlled by persons or companies outside mainland China.

Source: National Bureau of Statistics, China.

	2001	2004	2008
Domestic-funded enterprises			
State owned enterprises	369	192	156
Collective enterprises	858	456	260
Other joint-stock enterprises	300	406	638
Private enterprises	1,324	1,982	3,596
Other types	37	62	124
Foreign-funded enterprise	139	152	186
Total	3,027	3,250	4,960

156,000 (3.15%) in 2008. Over the same time span, the number of private enterprises nearly tripled, and the number of joint-stock enterprises not explicitly controlled by the State rose by over 110%. The State Council SASAC's statistics also show the number of nonfinancial SOEs controlled by provincial-level or higher SASACs falling from 150,000 at the end of 2003 to 115,115 at the end of 2009.

However, numbers alone do not gauge importance. The Party's policy of "grasping the big, letting go the small" (*zhua da fang xiao*) SOEs means that the remaining stable of SOEs is successively narrowed to the very largest. These mainly include monopolies in the natural resources and infrastructure sectors (such as mining, electricity, telecom, and fuels), and a few leading companies in other important industries (such as real estate, construction, and car manufacturing).[9] The 2008 Economic Census classifies the picture: only 3.15% of all enterprises as SOEs, but these contained 30.53% of total enterprise assets (Table II). Listed SOEs also constituted 27.85% of the total market capitalization of the Shanghai and Shenzhen stock markets at the end of 2009. Thus, China's remaining SOEs are extraordinarily large, and quite plausibly continue to play central roles in their industries and in the national economy.

[9] Source: State Council Guidelines for State-Owned Enterprises Reform (Decree 97, 2006), December 5, 2006.

Table II. Asset shares of various enterprises in 2008

Source: National Bureau of Statistics, China.

	Asset (trillion yuan RMB)	Proportion in total volume (%)
Domestic-funded enterprises		
State owned enterprises	63.5	30.53
Collective enterprises	9.0	4.33
Other joint-stock enterprises	86.9	41.78
Private enterprises	25.7	12.36
Other types	1.4	0.67
Foreign-funded enterprise	21.5	10.34
Total	208.0	100.00

Moreover, these figures almost certainly greatly understate the true scope of state control over nominally private sector and listed firms because many SOEs control business groups. These structures resemble the large family controlled pyramidal business groups familiar elsewhere in Asia, such as South Korea's chaebol business groups, in which an apex family firm controls a first tier of listed firms, each of which controls other listed firms, each of which controls yet more listed firms, and so on (La Porta, Lopez-De-Silanes, and Shleifer, 1999; Morck, Stangeland, and Yeung, 2000). The structures being organized in China are similar, but feature an SOE, rather than a family firm, at the apex. A firm in the lower tiers may seem to lack any controlling shareholder (and thus not explicated labeled as SOE), but the combined stakes of several SOEs or SOE controlled firms often aggregates to a control block.

According to the State Council SASAC's statistics, the 142 C-SOEs still extant in 2008 controlled a total of 19,250 subsidiary enterprises.[10] Of these, 8,524 are wholly state-owned; another 9,534 are state-controlled; and the remaining 1,192 are explicitly grouped as non-SOEs. Of the 19,250 enterprises, State Council SASAC's statistics count 235 as listed in mainland exchanges and 71 as listed in Hong Kong and the rest are not listed. By the end of 2009, the number of listed C-SOE-controlled firms in the mainland and Hong Kong rose to 260 and 88, respectively.[11] According to the State Council SASAC's statistics, these nonfinancial C-SOEs accounted

[10] Unless otherwise stated, figures in this paragraph are as reported in the State Council SASAC's "*2008 Annual Report*" or "*China's State-Owned Assets Supervision and Administration Yearbook 2008*".

[11] Source: State Council SASAC, "*2009 Annual Report*," August 3, 2010.

for about 40% of the assets, over 60% of the sales, and over 70% of the profits of all nonfinancial SOEs in China in 2009.

In summary, despite their small and decreasing numbers, SOEs, especially large C-SOEs, remain very significant economically. That they could play a central role in effecting China's macroeconomic stimulus package is quite plausible.

2.3 SOE BANKS

State-owned banks dominated China's financial sector since 1949 (Allen, Qian, and Qian, 2005, 2008), and recent reforms have not altered this. Banking sector reforms closely parallel those for nonfinancial SOEs. In 2003, as the SASACs were founded, the China Banking Regulatory Commission (CBRC) was also founded to direct and supervise all banks. Unlike the SASACs, the CBRC does not hold shares in the SOEs it directs. Rather, the major shareholders in SOE banks are the Ministry of Finance and a C-SOE, the Central Huijin Investment Ltd.

The Central Huijin Investment Ltd was established in 2003 as a branch of the State Association for Foreign Exchange (SAFE), an administrative agency subordinate to the People's Bank of China (PBOC). The State Council authorized Central Huijin Investment Ltd to buy equity in financial SOEs, thereby injecting capital to compensate for their accumulated nonperforming loans problems. In 2007, Central Huijin Investment Ltd was corporatized as a subsidiary of CIC, China's newly formed sovereign wealth fund (Pistor, 2010).

A fully owned subsidiary, Central Huijin constituted roughly one-third of the CIC's total assets in 2007. However, the CIC has no governance powers: Central Huijin's corporate charter specifies that its management and supervisory boards be appointed directly by the State Council (Pistor, 2010). Ownership and control thus appear separated. But, in practice, the Organization Department of the CPC appoints the top executives of Central Huijin and the CIC, and the CIC's portfolio is *de facto* an investments arm of the CPC; perhaps reuniting ownership and control at a basic level (Huang, 1996; Shih, 2008; McGregor, 2010).

Within this institutional framework, the CBRC and the Ministry of Finance issue documents, like those issued by the SASACs, directing SOE bank governance. For example, the "Interim Provisions on Performance Evaluation of State-owned and State-Controlled Financial Enterprises", issued by the Ministry of Finance in 2009, mandates the periodic evaluation of each SOE bank's profitability, asset appreciation, asset quality and solvency for purposes of determining the salary, reappointment and

promotion of each top executive. Also as with nonfinancial SOEs, SOE banks' core executives are appointed, removed, and re-assigned by the Organization Department of the CPC. Top executives at SOE banks thus confront the same dual goals of good firm performance and loyalty to Party dictates that their peers at other SOEs contend with. Panel B of Figure 1 depicts the effective governance structure of SOE banks.

The People's Bank of China, the country's central bank, classifies banks by ownership structure. Three important banks—China Development Bank, Export-Import Bank of China, and Agriculture Development Bank of China—are classified as "policy banks". These remain fully and directly owned by the state, and are intended as tools for state intervention in the economy. Another four major banks—Industrial and Commercial Bank of China, China Construction Bank, Agricultural Bank of China, and Bank of China—are classified as "state-owned commercial banks". These were corporatized and subsequently listed, but have long histories of State control, with the Ministry of Finance and Central Huijin Investment Ltd retaining sufficient equity blocks to lock in that control. Thirteen other major banks are classified as "joint stock commercial banks". Eleven of these have a C-SOE, L-SOE, or subnational government organ as their largest shareholder.[12] Rural credit cooperation associations, city commercial banks, foreign banks, and certain other financial institutions fall outside these categories. Thus, 18 of the 20 largest banks are directly State controlled and, at the end of 2009, accounted for RMB58.58 trillion, or about 73% of total bank assets (Table III).

3. China's SOE Macroeconomic Policy Channel

3.1 SOES' RESPONSES TO STIMULUS

Figure 2 shows how the global financial crisis hit China's finance sector. China's bankers' confidence index, based on the People's Bank of China's quarterly survey of about 3,000 city- or higher-level bank branch managers, dropped sharply in 2008 Q4, and bottomed out in 2009 Q1.

The global downturn also hurt nonfinancial SOEs badly. State Council SASAC's statistics for 2008 show that nonfinancial SOEs' profits fell by 24.5% at the national level, with 45.5% of these SOEs suffering losses.

[12] The central government, either directly or via C-SOEs, is the largest shareholder in five of these: the Bank of Communications, China Citic Bank, China Everbright Bank, Huaxia Bank, and China Merchants Bank. The other six, with local governments as the largest shareholder, are the Industrial Bank, Guangdong Development Bank, Shanghai Pudong Development Bank, Evergrowing Bank, China Zheshang Bank, and China Bohai Bank.

Table III. Banking financial institutions at the end of 2009

Note: See the text for the full list of the four groups of banks.

Source: People's Bank of China; China Banking Regulatory Commission.

	Number		Asset (trillion RMB)	
	Amount	Share (%)	Amount	Share (%)
Policy banks	3	0.05	6.95	8.63
State-owned commercial banks	4	0.07	39.04	48.47
Joint-stock commercial banks				
State as largest share holder	11	0.20	12.59	15.63
Others	2	0.04	2.01	2.50
Others				
City commercial banks and credit union	158	2.80	5.71	7.09
Rural commercial banks and credit union	5,241	93.02	8.64	10.73
Postal savings bank	1	0.02	2.70	3.35
Foreign banks	32	0.57	1.35	1.68
Nonbank institutions	182	3.23	1.55	1.92
Total	5,634	100.00	80.53	100.00

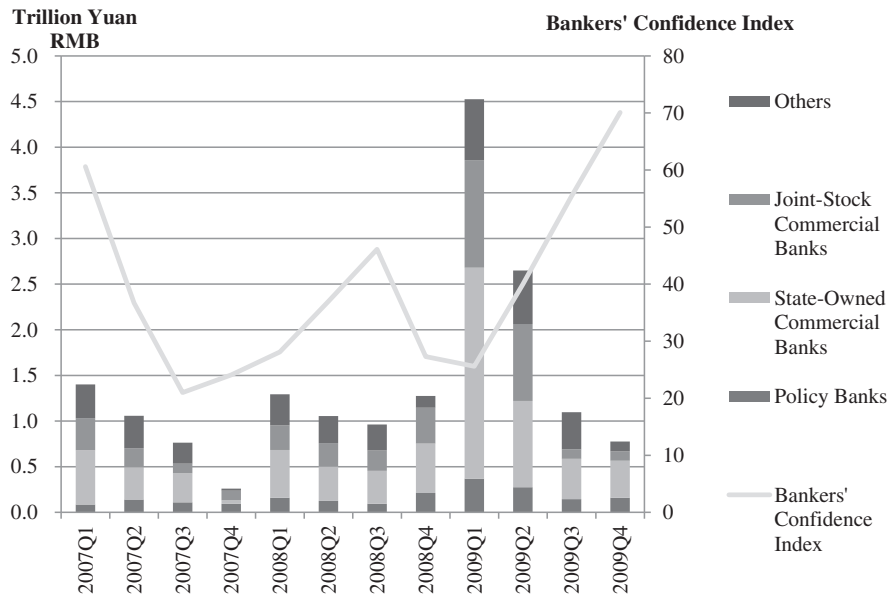

Figure 2. Loan balance increase and bankers' confidence index. *Source*: People's Bank of China (the central bank in China).

Both returns on sales (ROS) and profits were in deep troughs in 2008 and neither improved until 2009 Q3 (Figure 3). The performance of C-SOEs, also tracked by the State Council SASAC, follows a similar pattern. China's Entrepreneur Confidence Index, based on a National Bureau of Statistics quarterly nationwide survey of 20,000 enterprise managers, hit a historic low at the start of 2009 (Figure 4).

Amid this drop in confidence, the government announced an expansionary shift in monetary policy. In 2009, according to National Bureau of Statistics figures, the PBOC raised the quantity of money in circulation by 12.0% (or RMB 444 billion) and financial institutions' deposits in the PBOC increased by 11.2% (or RMB 1,032 billion). In total, "reserves" as PBOC liabilities rose by 11.4% (or RMB 1.476 trillion) and the PBOC's foreign exchange reserves rose 17.1% (or RMB 2.553 trillion). The monetary base increased by 9.9% (RMB 2.043 trillion).

This money injection was implemented via a two-pronged expansionary monetary policy package: a drop in the government stipulated basic lending rate and a relaxation in commercial banks' reserve requirement ratios. Between September and December 2008, the PBOC cut the base 1-year lending rate from 7.47% to 5.31% in five consecutive decreases.[13] During the same period, the PBOC cut commercial banks' reserve requirement ratio in three consecutive waves from 17.5% to 15.5% for large banks and 13.5% for medium-sized and small banks.

In the wake of the PBOC's expansionary monetary policy, China's central government-controlled commercial banks—the four large state-owned commercial banks and thirteen joint-stock commercial banks—immediately initiated a huge volume of new loans in the 1st quarter of 2009 (Figure 2). The four state-owned commercial banks' total loan balance increased by 17.49% (RMB 2.31 trillion) in that quarter, compared with the end of 2008, substantially more than the total increase of RMB 1.80 trillion over the entire year of 2008. Over the full year of 2009, the growth rate of their total loan balance reached a historic high of 31.03% (or RMB 4.1 trillion), almost twice as much as the growing speed in 2008 (15.78%, or RMB 1.8

[13] The PBOC sets base lending and the deposit interest rates. Individual banks can vary the rates they actually use within ranges that the PBOC also sets. Until 2004, the permissible lower and upper bounds around the base lending rate were 90%–110% for large banks and 90%–130% for small and medium size banks. Banks can adjust their actual lending rates on outstanding loans annually to reflect the base rate current at the end of each loan year. In 2004, the PBOC removed the upper bound on the lending rate. From 2008 to 2009, despite the market turbulence, roughly 85% of new loans had lending rate of less than 130% of the base rate, and the fraction with rates above the base rate actually fell from 45.9% in 2008 to 38.2% in 2009.

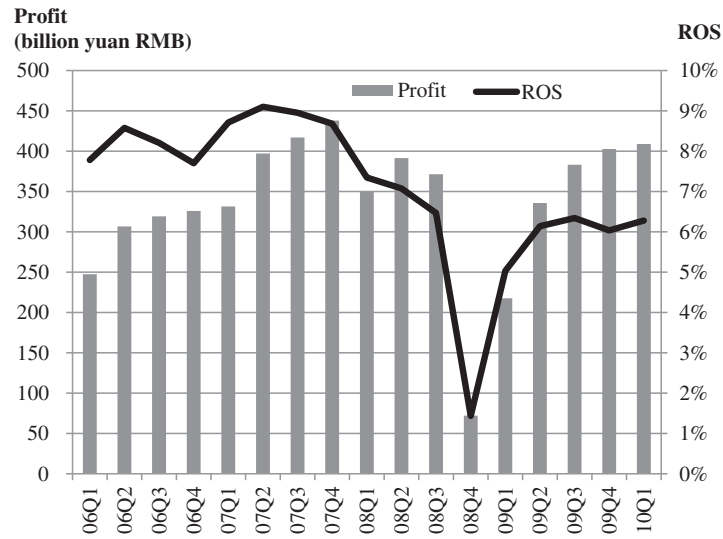

Figure 3. Quarterly performance of SOEs. *Source*: Ministry of Finance, China.

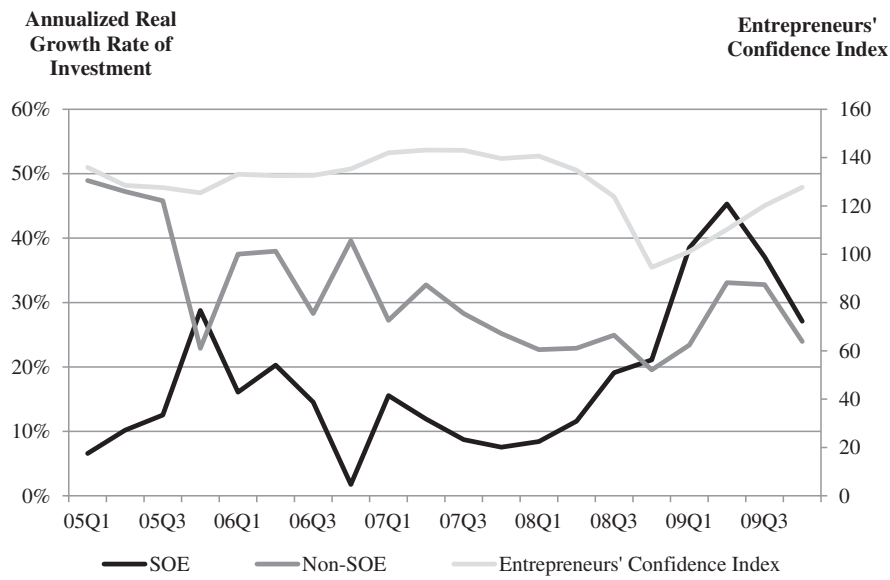

Figure 4. Annualized real growth rate of fixed asset investment and entrepreneurs' confidence. *Source*: National Bureau of Statistics, China.

trillion). This brought their share of in loan increase up from 36.78% in 2008 to 42.73% in 2009, abruptly reversing their steady loss of market share to city commercial banks and foreign banks. China's joint-stock commercial banks likewise increased their loans outstanding by 19.76% (or RMB 1.18 trillion) in the 1st quarter of 2009 and 37.39% (RMB 2.23 trillion) over in that whole year, respectively, compared with the loan balance at the end of 2008. Finally, the real growth rate of total loan balance in all commercial banks reached a historic high of 32.7%.

Nonfinancial SOEs also responded to the government's call for economic stimulus with prompt and substantial hikes in investment. Prior to 2008, nonfinancial SOEs' annualized real growth rate in fixed asset investment typically lagged that of corporations officially classified as non-SOEs by about ten percentage points (Figure 4). However, their growth rate accelerated sharply—from 21.09% in 2008 Q4 to 38.50% in 2009 Q1 and 45.30% in 2009 Q2. Across all four quarters of 2009, their fixed asset investment growth rate remained substantially higher than normal. In contrast, non-SOEs' annualized growth rate in fixed asset investment remained at its usual level through all the four quarters of 2009.

With banker and entrepreneur confidence indexes dragging at or near historic lows, and with bank and nonfinancial SOEs navigating increasingly choppy business environments, these abrupt expansions in lending and investment were unlikely to be driven by enterprise profit maximization. Rather, the top executives at SOE banks and nonfinancial SOEs were instructed to implement these policies by the central government.

The central government made "contributions to the stimulus plan" a new corporate performance objective, as highlighted in State Council SASAC's 2009 annual report, to be used for evaluating SOE executives; and most bank and nonfinancial SOEs' annual reports, or similar documents, echo this. Senior Chinese government officials' speeches exhorted SOEs to "serve the country's interest", and the Organization Department of the CPC is widely believed to weigh obedience to Party heavily in promoting, renewing, or demoting SOE executives. While neither the CPC Organization Department nor the SASAC ever publicly state the criteria applied in these decisions, the December 2009 document, "Interim Provisions on Management of Senior Executives in Central SOEs" (中央企业领导人员管理暂行规定), jointly published by the Central Committee of the CPC and the State Council, refers to the principle requirement of "political loyalty" (*zheng zhi su zhi hao*, 政治素质好), followed by "outstanding performance" (*jing ying ye ji hao*, 经营业绩好).

Thus, responding quickly and meaningfully to the government's monetary policy stimulus became an SOE "policy burden" and an explicitly stipulated

objective for SOE managers. The CPC Organization Department's centralized control over SOE executives' careers thus became, in effect, a "channel" for the transmission of a monetary stimulus from the central bank into the real economy.

Figure 5 graphically depicts how central government state-controlled commercial banks' responsiveness to the call to action and performance is linked to their top managers' promotion odds. Because there are only four C-SOE banks, statistical analysis is unnecessary. In 2000, Jianqing Jiang became CEO of the Industrial and Commercial Bank of China (ICBC), which substantially outperformed the other three C-SOE banks, posting a higher ROE, a better capital adequacy ratio, and a lower nonperforming loan ratio. All this made Mr Jiang a well-respected executive in global banking circles. However, during the stimulus period, the ICBC responded to central government's call markedly less enthusiastically than the other three C-SOE banks did, expanding its lending much less aggressively. In 2009, the ICBC's annual loan balance expanded by 25.9%. While substantial by normal standards, this pales beside the average loan growth rate of 36.5% for the other three C-SOE banks. Despite Mr Jiang's outstanding banking industry track record, he was the only one among the four C-SOE banks' CEOs not promoted to the CPC central committee after the stimulus.

A similar pattern is evident in the individual career paths of prominent nonfinancial C-SOEs' CEOs. For example, Jiemin Jiang, CEO of China National Petroleum Corporation and Shulin Su, CEO of China Petrochemical Corporation, whose firms both dramatically boosted capital investment in the wake of the monetary stimulus, were both subsequently promoted.[14] Unfortunately, a statistical analysis of C-SOE career paths after 2009 is not possible: only 10 of the 142 C-SOEs are listed (these are airlines, steel companies, and telecommunication companies) and rewards for their political obedience are not necessarily manifested in a form of observable

[14] The total assets of China National Petroleum Corporation and China Petrochemical Corporation increased by 23.17% and 22.92% in 2009, while the number for all C-SOEs was 19.45% in 2009. But these two companies, because of their sheer size, tended to have slower than average growth before the stimulus period. For example, in 2008 the total asset of all C-SOEs grew by 18.10%, but these two firms only by 8.03% and 5.52%, respectively. In the current CPC organization chart, the CEO of a C-SOE is at the same level as a deputy ministry (*fu sheng bu ji*, 副省部级). In March 2011, after the stimulus, China National Petroleum Corporation's CEO was promoted to Director of the SASAC in State Council, a ministerial (*sheng bu ji*, 省部级) position. He was subsequently sacked in September 2013 amid a corruption probe (BBC September 3, 2013: "Jiang Jiemin: China Sacks Former Energy Chief"). In March 2013, China Petrochemical Corporation's CEO was promoted to governor of Fujian Province. Provincial governors are also recognized by the CPC as equivalent in status to ministers in the central government.

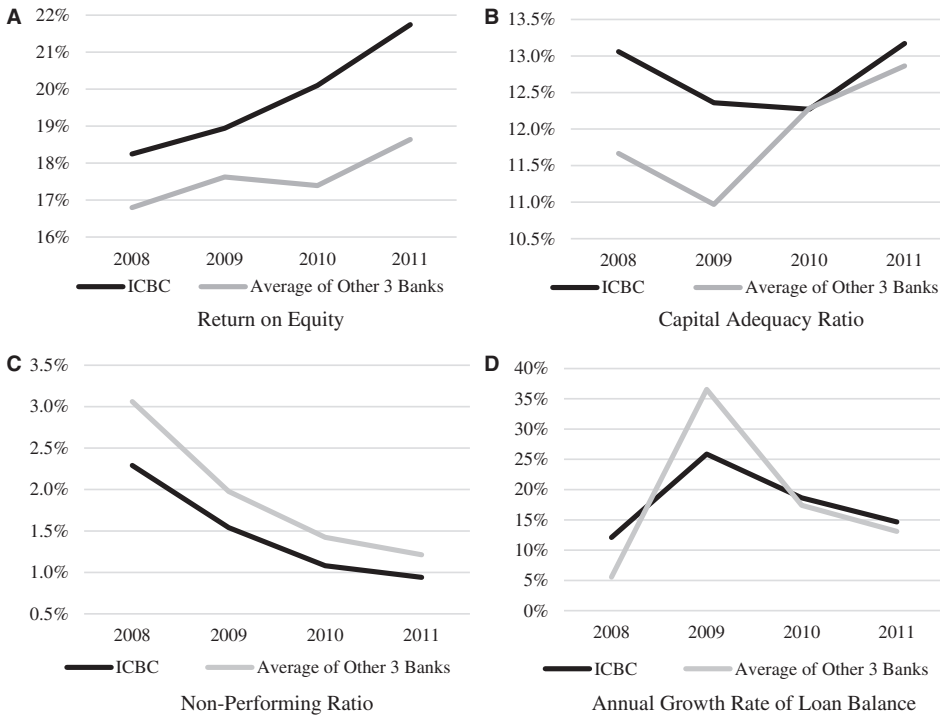

Figure 5. Comparisons between ICBC and other three SOE Banks. (A) Return on equity. (B) Capital adequacy ratio. (C) Nonperforming ratio. (D) Annual growth rate of loan balance. *Source*: annual financial reports of the four banks.

near-term career movement. More generally, information about the effective compensations and career paths of C-SOEs' CEOs is not readily available to researchers. Thus, although nonfinancial C-SOE CEOs' careers are surely governed by the same criteria of "political loyalty", followed by "outstanding performance", listed in the December 2009 joint CPC Central Committee and State Council document described above; data limitations preclude statistical validation. Thus, we cannot rule out the possibility that C-SOE bank CEOs were the primary decision-makers under pressure to transmit the monetary expansion, and that nonfinancial C-SOE CEOs, offered loans on terms too good to refuse, simply opted to borrow and bet on real estate investments.

3.2 POTENTIAL PROBLEMS WITH THE SOE CHANNEL

The dual objectives assigned managers of SOE banks and nonfinancial SOEs—to advance the government's political objectives and optimize SOE

financial performance—remained in effect as SOEs fulfilled these policy burdens. Assessing borrowers on the basis of the likely financial viability of their investment plans is time consuming and requires expensive expertise. Given the government's policy directive to increase lending immediately and substantially, careful evaluation of lending decisions was almost certainly simply not possible. Rational SOE bank executives would doubtless obey the directive, but perhaps in ways that minimize damage to the financial performance of their banks, thereby protecting their annual bonus packages and their promotion prospects at the end of their 3-year terms in their current positions. SOE Banks, obliged to issue huge volume of loans, would thus favor borrowers perceived as unlikely to default, at least in the near future.

Confronted with career-related pressure to boost lending, C-SOE bankers saw large C-SOEs as preferred borrowers. According to SASAC State Council statistics, all nonfinancial C-SOEs' leverage (total debts/total assets) increased from 53.64% in 2007 to 63.23% in 2010, while that the nationwide average leverage for all nonfinancial L-SOEs hovered almost unchanged (65.05% in 2007 and 65.22% in 2010). National Bureau of Statistics data show all industrial non-SOEs' leverage actually decreased from 58.27% in 2007 to 55.33% in 2010.

C-SOEs are preferred lending targets for several reasons. First, lending to large C-SOEs was "politically correct". Nonperforming loans made to other borrowers, especially private corporations, would leave SOE bankers open to criticism; but decisions to let SOEs, especially C-SOEs, become "nonperforming" would be made by high government and party officials, sheltering SOE bankers from blame.

Second, large C-SOEs' top managers quite rationally expected that, if the downturn proved long and deep, the State was likely to save them from serious trouble. For example, in the wake of the Asian Financial Crisis in the late 1990s, some 25% of the four C-SOE banks' loans were nonperforming. Most of these were loans to SOEs, and thus were defined as "nonperforming loans due to policy reasons (*zheng ce xing bu liang dai kuan*)". At the beginning of the 2000's, a *de facto* government bailout transferred RMB 1.4 trillion of these nonperforming loans due to policy reasons, at book value, to four state controlled asset management companies. This immediately solved the four C-SOE banks' nonperforming loan problems (Podpiera, 2006). More generally, SOE, and C-SOEs in particular, are historically less likely to default than other enterprises. In China, publicly listed firms must disclose default events. Of the 1,904 firms listed in Shenzhen and Shanghai in 2003 and not already in default, seventy-nine default before 2010. Of these, five (6%) are of C-SOEs, thirty (38%) of

L-SOEs, and forty-four (56%) of non-SOEs. The corresponding unconditional probabilities for having defaulted for at least once are 1.49% for C-SOEs, 3.75% for L-SOEs, and 3.97% for non-SOEs. The corresponding unconditional probabilities of default, on a firm-year basis, are 0.26% for C-SOEs, 1.58%, for L-SOEs, and 2.31% for non-SOEs.[15]

The managers of nonfinancial SOEs, having borrowed these funds, had to invest them quickly to demonstrate adherence to the government's stimulus plan, but also needed to avoid damaging the financial performance of their SOEs, and thus their bonus income streams. Like the top managers of SOE banks, nonfinancial SOEs are evaluated annually for bonuses and triennially for promotions. Investments that would not show major problems for at least 3 years were thus needed.

Large corporate capital investments require careful planning, forecasting, risk assessment, and other financial analysis; and this too takes time and money. Formulating profitable capital investments is daunting under normal conditions; amid a global economic downturn, the task can be petrifying. Nonfinancial SOE managers were thus hesitant to invest in property, plant, and equipment associated with their primary lines of business; fearing that such investments would do poorly in the near-term future. The National Bureau of Statistics estimates the mean ROA of 23 of the 38 industrial sectors it covers as below the loan interest rate (5.31%) in 2008.

Thus, nonfinancial SOE managers needed nontraditional investments whose returns would likely cover their borrowing costs—at least until positive triennial evaluations moved them on to higher positions elsewhere in the economy.

Real estate seemed to fill this bill for several reasons. First, real estate prices in major cities rose steadily over the preceding years, making residential real estate development one of the most profitable industries. Table IV, based on the two latest economic censuses by the National Bureau of Statistics, shows that the real estate sector's returns on sales (ROS) rose faster than that of any other sector—from 8.31% in 2004 to 12.62% in 2008, when it ranked third in profitability, behind only "mining" and "other services" (which include Finance, IT, Science Research, Education, Media, etc.). The average ROS of all nonreal estate industries was 5.20% in 2004 and 7.75% in 2008, about 3–5 percentage points lower than the real estate industry. In major cities with hot housing markets, the sector's ROS was even higher in 2008, reaching 14.99% in Beijing and 17.90% in Shanghai. Second, real estate is relatively easy to enter, at least compared to other highly profitable industries. For example, entering "mining", the

[15] Firm size and industry also correlate with bankruptcy rates. Probits predicting bankruptcy and controlling for size and industry yield very similar mean probabilities.

Table IV. Rate of return-on-sale for various industries in 2004 and 2008

Note: Return-on-sales is the ratio between an industry's aggregated profits and aggregated sales.

Source: National Bureau of Statistics, China.

	2004 (%)	2008 (%)
Mining	20.74	23.16
Manufacturing	5.04	5.27
Production and supply of electric power, water, and gas	5.79	2.25
Construction	2.81	3.69
Transportation, storage and post	8.77	10.49
Real estate	**8.31**	**12.62**
Wholesale and retail trade	1.94	–
Accommodation and catering	1.67	–
Other service industries	10.23	15.33
All industries	5.30	7.94
All nonreal estate industries	5.20	7.75

most profitable sector, requires locating and developing ore deposits; and the sector is, in any event, given over to state-licensed monopolies. The same applies to many "other services". For example, the financial sector, though also highly profitable, is not open to entry because of a system of state-rationed licences. In contrast, any nonfinancial SOE with ready cash might take to buying land or residential apartment blocks, and even to building them, with some hope of financial success. In additional, during the stimulus period, SOEs were under no explicit restrictions against investing in real estate as opposed to their core sectors. (For years privately owned corporations have free entries into real estate markets.)

Accordingly, many C-SOEs, obeying political directives to hike their borrowing from SOE banks and invest, opted to invest in real estate. While SASAC guidelines list only sixteeen C-SOEs with real estate development as core business, these and seventy-eight other C-SOEs owned or controlled real estate developers by the end of 2009. Most of these concentrated on real estate in a few major cities, where their buying pushed up lot prices substantially. Indeed, C-SOE land purchases are widely thought responsible for land and housing price surges these cities experienced during the recovery. The next sections assess the validity of this sentiment.

4. Land Transaction Data

All urban land was nationalized at the founding of the People's Republic of China in 1949. Under the Constitutional Amendment of 1988, the State

retains ultimate ownership of urban land, but allows individuals and enterprises to lease land use rights for specified periods. For example, residential lot leases typically last 70 years. A private housing development project might involve a developer leasing lots from a local government, building housing units on the lots, and then selling the developed units. A State Council mandate, issued in 2002 and reiterated in 2004, requires that leases for urban lots designated for residential development be sold at auctions.[16] In most cases, the developer entering the highest bid gets the lease.

We collect land parcel auction data in eight major Chinese cities: Beijing, Chengdu, Hangzhou, Shanghai, Shenzhen, Tianjin, Wuhan, and Xian. These are all large cities, with relatively developed economies and housing markets. In 2009, their combined GDPs constituted 17.3% of China's GDP, and 35% of new home sales occurred within the nation.[17]

Our data, from the Soufun Database and local land resources authorities' websites, contain 3,542 land transaction records.[18] These include all such public residential land lease sales in these eight cities from 2003 Q1 through 2010 Q1, except leases for land entirely designated for public housing, which we exclude because their prices are determined using other mechanisms. We exclude transactions involving commercial or industrial use land parcels because SOEs in any sector might, in the normal course of business, develop new office or factory space. In contrast, shoe-making, textiles, or cement SOEs purchasing residential-use land leases signify unusual investment activity of a sort more apt to be a response to the stimulus policy.[19] In April 2010, with China's economic recovery seemingly drawing to a successful conclusion, with America's real estate bubble still in the news, and with high and rising urban land prices attracting attention, the State Council SASAC explicitly discouraged C-SOEs, especially those for which real estate is not a core business, from further participation in lease auctions. Our data thus include the period in which China's macroeconomic stimulus was in high gear, and in which C-SOE investment options were unrestricted. Table V describes the distribution of these transactions across the eight major cities we study.

[16] Three variants are permitted: one-stage auction, two-stage auction, and an alternative bidding process. See Cai, Henderson, and Zhang (2009) for details.

[17] Calculation based on Nation Bureau of Statistics data and municipal statistics for each city.

[18] Soufun is a leading Chinese data vendor specialized in land and housing transaction data. The company's website is fdc.soufun.com.

[19] Previously, state-owned firm could construct social housing for their employees. This was prohibited by 1990s reforms, leaving the construction of units for sale or rental at market rates their only entry point into the residential real estate sector.

Table V. Geographic distribution of residential land transactions in eight major cities (2003Q1–2010Q1)

Source: Authors' calculation based on the land transaction database described in the text.

City	Deals	Floor area (million sq. m.)	Total price (billion yuan RMB)	Average price (2003 yuan per sq. m.)
Beijing	309	44.31	186.10	4,200
Chengdu	710	113.58	126.22	1,111
Hangzhou	704	60.89	214.86	3,529
Shanghai	401	48.22	167.99	3,484
Shenzhen	115	13.89	35.02	2,521
Tianjin	449	105.60	128.00	1,212
Wuhan	637	84.51	103.81	1,228
Xian	217	32.89	23.86	725
Total	**3,542**	**503.88**	**985.87**	**1,957**

Our data include each land parcel's location and physical attributes as well as its sale price and date. For each parcel, we ascertain the buyer's characteristics from the eight cities' municipal real estate authority databases. These classify each buyer as a C-SOE, L-SOE, or non-SOE. Here, the ownership characteristics are those of the ultimate controlling owner of the buyer. That is, a buyer is classified as a C-SOE if it is controlled by another firm that is controlled by another firm and so on that has an ultimate controlling owner firm that is, in turn, controlled by the SASAC of the State Council. Similarly, a buyer is classified as an L-SOE if its ultimate owner is controlled by the SASAC of a provincial, prefectural, or district government. Buyers are non-SOEs in all other cases. Within each classification, buyers are also assigned grades, from one (highest) through five (lowest), awarded by the relevant local housing authority according to each buyer's size and experience as a developer. This also lets us distinguish listed from unlisted buyers. Table VI displays the definitions and descriptive statistics of the variables so constructed.

A cursory inspection of our data supports the thesis that SOEs abruptly increased their activity in the real estate development business as the macroeconomic stimulus package was unfolded. Figure 6 reveals C-SOEs with the smallest market share and non-SOE developers dominating the market until 2008; after which the C-SOEs' market share grew at the expense of the other two groups. C-SOEs' share by total value rose from about 15% in 2008 to about 23% in 2009, peaking at about 33% in 2010 Q1.

Table VI. Definition and descriptive statistics of variables

Variable	Definition	Mean	Std. Dev.
LP	Land parcel transaction price (constant 2003 RMB per square meter of floor area of housing permitted to build on the parcel).	2,145.21	2,838.51
D_CENTER	Distance to the city center; in kilometers.	25.61	23.17
DENSITY	Ratio of floor area to land area.	2.54	1.53
RATIO_PH	Share of public housing required in the total floor area of the parcel.	0.002	0.05
LANDLEVEL	The parcel is leveled when delivered to the buyer or not; 1 = yes, 0 = o/w.	0.57	0.50
SIZE	Floor area permitted to build on the parcel; in million square meters.	0.14	0.25
PUBLIC	Part of the parcel is designated for public use or not; 1 = yes, 0 = o/w.	0.05	0.21
AUCTION	The parcel is transacted by one-stage auction or not; 1 = yes, 0 = o/w.	0.24	0.43
BIDDING	The parcel is transacted by bidding or not; 1 = yes, 0 = o/w.	0.10	0.30
CSOE	The parcel is purchased by a C-SOE developer or not; 1 = yes, 0 = o/w.	0.08	0.27
LSOE	The parcel is purchased by an L-SOE developer or not; 1 = yes, 0 = o/w.	0.20	0.40
LISTED	The parcel is purchased by a listed company or not; 1 = yes, 0 = o/w.	0.24	0.43

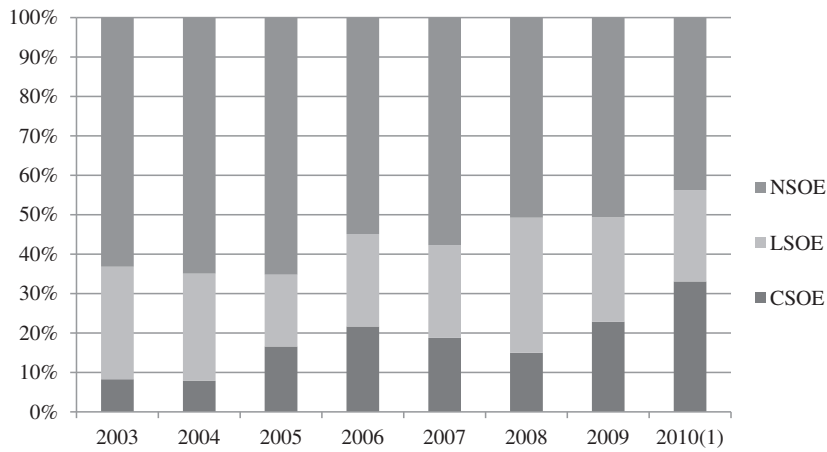

Figure 6. Market share by total value of the three categories of buyers. Categories are central government-controlled state-owned enterprise (CSOE), lower-level government-controlled state-owned enterprises (LSOE), and enterprises not designated as controlled by a government (NSOE). *Source*: Authors' calculation.

Table VII reveals substantial variation across cities in C-SOE and L-SOE entry. In Beijing, C-SOEs' favorite market, they roughly doubled their market share from its historic level of 24% (2003–08) to 53.54% in 2009 and 2010 Q1, when the stimulus package was unfolded. Simultaneous surges in market shares are also clearly evident in other typically C-SOE active cities, Shanghai, Chengdu, Tianjin, and Wuhan, but less so in the other three cities. The nearly 25% drop in Shenzhen perhaps reflect that special economics zone's integration with Hong Kong's globally well-connected economy, which may detach it somewhat from policies in effect elsewhere. Meanwhile, the market share of L-SOEs dropped by 20% in Beijing, 10% in Wuhan and Shenzhen, rose only modestly in Xian (9%) and Hangzhou (6.3%), and changed relatively little in the other major cities.

5. Empirical Analysis of Land Auctions in Eight Major Cities

5.1 HEDONIC MODEL OF CONSTANT QUALITY PRICE INDEX

Our first objective is to understand whether changes in land parcel prices are related to the stimulation packages. To compare the price of heterogeneous land parcels, we use a pooled hedonic land pricing model. The dependent variable is transaction price for each parcel in the logarithmic form (in constant 2003 RMB) measured as the price per square meter of the permitted housing floor space.[20] To control for quality variation, we include the distance to the city center (*D_CENTER*), the permitted building density expressed as permitted floor space over land area (*DENSITY*), and requirements to provide public housing units on the parcel (*SHARE_PH*). We expect all three to correlate negatively with a parcel's price. We also control for site quality at delivery, measured by whether the land is leveled or not (*LANDLEVEL*), and expect higher prices for leveled land. We also control for the parcel's size (*SIZE*), requirement to build public utilities such as school or hospital on the parcel (*PUBLIC*), and the form of the transaction (*AUCTION* for one-stage traditional English auction and *BIDDING* for a sealed bidding process, with two-stage auctions as the left-out category). All regressions include city and quarter fixed effects. Introducing city-quarter fixed effects does not qualitatively change our results.

Table VIII reports the results of our basic hedonic model, estimated by OLS with one-dimensional residuals clustering by either city (column 1) or

[20] Note that in China, land parcels of residential use are always priced in the floor area of housing permitted to be built on the parcel, instead of being priced in terms of the land area.

Table VII. SOE developers' share in land market (by total value)

Source: Authors' calculation based on the land transaction database described in the text.

	C-SOEs			L-SOEs		
City	2003–08 (%)	2009–10(1) (%)	Change (%)	2003–08 (%)	2009–10(1) (%)	Change (%)
Beijing	24.33	53.53	29.20	37.63	17.23	−20.40
Chengdu	16.01	26.31	10.30	10.25	11.92	1.67
Hangzhou	8.24	6.68	−1.56	15.21	21.53	6.32
Shanghai	19.85	29.97	10.12	31.11	33.64	2.53
Shenzhen	31.55	6.76	−24.79	25.96	15.30	−10.66
Tianjin	9.63	17.19	7.56	41.71	43.13	1.42
Wuhan	19.24	23.37	4.13	30.72	21.36	−9.36
Xian	8.91	12.98	4.07	18.62	27.66	9.04

Table VIII. Basic hedonic model of land parcels' price

Sample is all land transactions from the first quarter of 2003 to the first quarter of 2010 in eight major cities, as described in Table V. The dependent variable is the natural log of land price per square meter of permitted housing floor area. Right-hand side variables as defined in Table VI.

Notes: (1) Coefficients of city and quarter fixed effects are not shown. (2) Number of observations is 3,478. (3) ***Significant at the 1% level; **significant at the 5% level; *significant at the 10% level.

		t-ratios with residuals clustered by		
	Coefficient	(1) City	(2) Quarter	(3) City and quarter
log(*D_CENTER*)	−0.77	−17.88***	−32.37***	−18.18***
DENSITY	−0.12	−2.76**	−7.90***	−2.84***
SHARE_PH	−0.11	−0.88	−0.74	−0.91
LANDLEVEL	0.07	0.45	0.80	0.47
SIZE	−0.11	−1.38	−2.58**	−1.42
PUBLIC	0.17	2.74**	2.57**	2.49**
AUCTION	0.29	3.40**	4.76***	3.57***
BIDDING	−0.09	−0.65	−1.01	−0.63
City dummies			Yes	
Quarter dummies			Yes	
Developer grade dummies			Yes	
Adjusted R^2			0.60	

quarter (column 2), or with two dimensional simultaneous clustering by city and by quarter (column 3), respectively (Petersen, 2009; Cameron, Gelbach, and Miller, 2011).

The coefficients of the controls are broadly consistent with our expectations. Land parcels nearer city centres and with lower building densities fetch higher prices per square meter of permitted floor area; though parcels levelled before delivery fetch insignificantly higher prices and parcels with public housing requirements fetch insignificantly lower prices. The method of sale controls associate one-stage auctions with higher prices, two-stage auctions with intermediate prices, and the bidding process with lower prices.

The coefficients on the quarterly time dummies are plotted in Figure 7; and can be interpreted as a real constant quality residential land price index for these cities. The figure shows land prices surging in 2009 Q2 and rising until they peaked at the end of 2009. Overall, the index almost doubled (97.4%) from 2009 Q1 to 2009 Q4; corresponding neatly to the surge in lending to SOEs, and especially C-SOEs that Figure 2 shows beginning in 2009 Q1.

A near doubling of land price within 1 year is extraordinary by any reasonable standards. Fundamentals explanations are always possible if one is flexible enough with assumptions. For example, wild swings in rational agents' expectations due to radical shifts in political or economic forecasts, demand, regulation, savings behavior, might do the trick. However, the abrupt prominence of C-SOE developers as land prices surged is surely strong circumstantial evidence consistent with our thesis.

5.2 ESTIMATING THE PRICE EFFECT OF SOE DEVELOPERS

We further explore the linkage between SOE participation in the real estate sector and land parcel prices by including buyer characteristics in our regressions. These include indicator variables for buyers controlled by C-SOEs and L-SOEs, respectively; an indicator variable set to one if the buyer is a listed firm, *LISTED*; and a set of indicator variables corresponding to the grade the government assigns the developer, *GRADE1* through *GRADE5* in descending order of quality. Table IX reports the results. Again, as in Table VIII, each of the three variants of residual clustering is applied in turn, and the results are qualitatively similar. The indicator variables for C-SOE and L-SOE buyers, especially the former, attract significantly positive coefficients, implying that they offer inexplicably (in terms of the control variables) high prices for land parcels. C-SOEs and L-SOEs pay 16% and 11% more, respectively, than non-SOE buyers for land parcels that are otherwise identical in terms of the characteristics we observe. These findings are

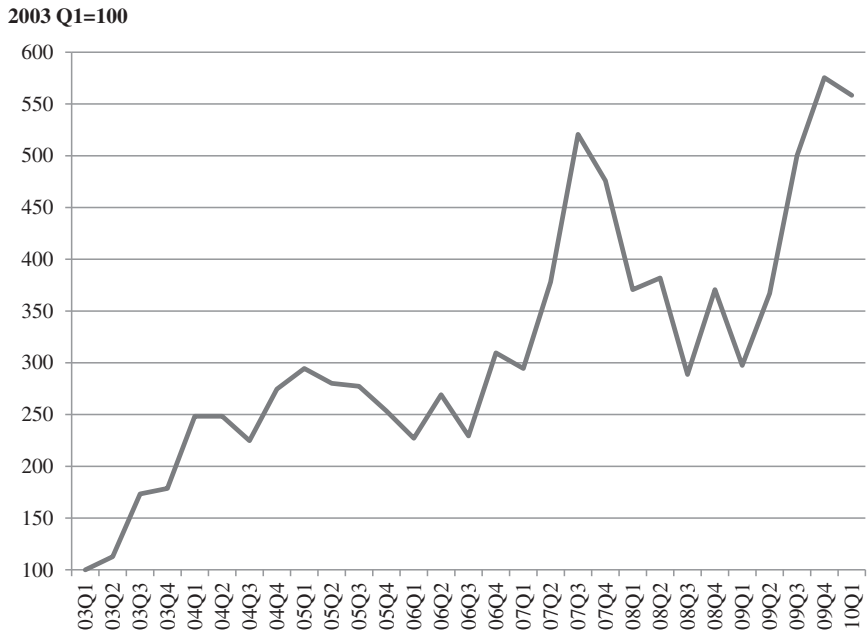

Figure 7. Constant quality index of residential land price index. The figure plots the coefficients on the quarterly time dummies from Table VIII, which can be interpreted as a real constant quality residential land price index for these eight cities.

consistent with SOEs obtaining new credit via the stimulation package and using this to buy real estate, thereby driving up real estate prices.

These price premiums at least partially explain the surge we observe in residential land prices. Figure 8 provides the constant quality prices of different buyer groups. The figure shows the C-SOE group's constant price index surges in 2009 Q1, followed by the other groups' price indices, and the C-SOEs' index persistently exceeds those of others after 2009 Q1. This clearly suggests that the C-SOEs' participation in land lease markets plays a role in the rise of land prices in China from 2009 Q1 through the end of our sample. Our estimate is likely conservative, for in a China without the surge in C-SOE bids, other developers' bids would surely be lower than those we observe.

5.3 ROBUSTNESS

Other factors than the government's monetary stimulation policy might contribute to C-SOE real estate developers' high bids. First, C-SOEs' connections have surely long provided privileged access to government funds, loans

Table IX. Effect of buyers' type on land parcels' price

Sample is all land transactions from the first quarter of 2003 to the first quarter of 2010 in eight major cities, as described in Table V. The dependent variable is the natural log of land price per square meter of permitted housing floor area. Right-hand side variables as defined in Table VI.

Notes: (1) Coefficients of city and quarter fixed effects are not shown. (2) Number of observations is 3,478. (3) ***significant at the 1% level; **significant at the 5% level; *significant at the 10% level.

		t-ratios with residuals clustered by		
	Coefficient	(1) City	(2) Quarter	(3) City and quarter
CSOE	0.16	1.74*	3.74***	1.87*
LSOE	0.11	2.38**	2.69**	2.15**
log(*D_CENTER*)	−0.71	−14.95***	−33.01***	−15.33***
DENSITY	−0.10	−2.50**	−7.07***	−2.58**
SHARE_PH	−0.22	−3.02**	−1.77*	−3.14***
LANDLEVEL	0.07	0.48	0.83	0.49
SIZE	−0.21	−2.21*	−3.41***	−2.12**
PUBLIC	0.11	1.34	1.99*	1.37
AUCTION	0.28	4.76***	4.70***	5.16***
BIDDING	−0.17	−1.46	−2.08**	−1.41
LISTED	0.14	3.28**	3.16***	3.63***
City dummies		Yes		
Quarter dummies		Yes		
Developer grade dummies		Yes		
Adjusted R^2		0.63		

from SOE banks, etc. (Allen, Qian, and Qian, 2005) which would cut their costs of capital and justify their higher bids for land parcels. Second, C-SOEs' connections might likewise provide speedier permit approval, utility access, and so on; which would make real estate developments more profitable for C-SOEs, again justifying their paying higher prices for land parcels.

However, neither alternative fully explains our findings. C-SOEs' superior connections have long been a fixture of Chinese business (McGregor, 2010). Figure 8 shows that C-SOEs only began paying prices substantially higher than those paid by other buyers when the stimulus program began. Before that, C-SOEs' prices were sometimes slightly above or below those paid by other buyers. Panel A in Table X confirms that this effect is statistically significant: the gap between C-SOEs' bids and those by other buyers became significantly elevated after the first quarter of 2009, when the

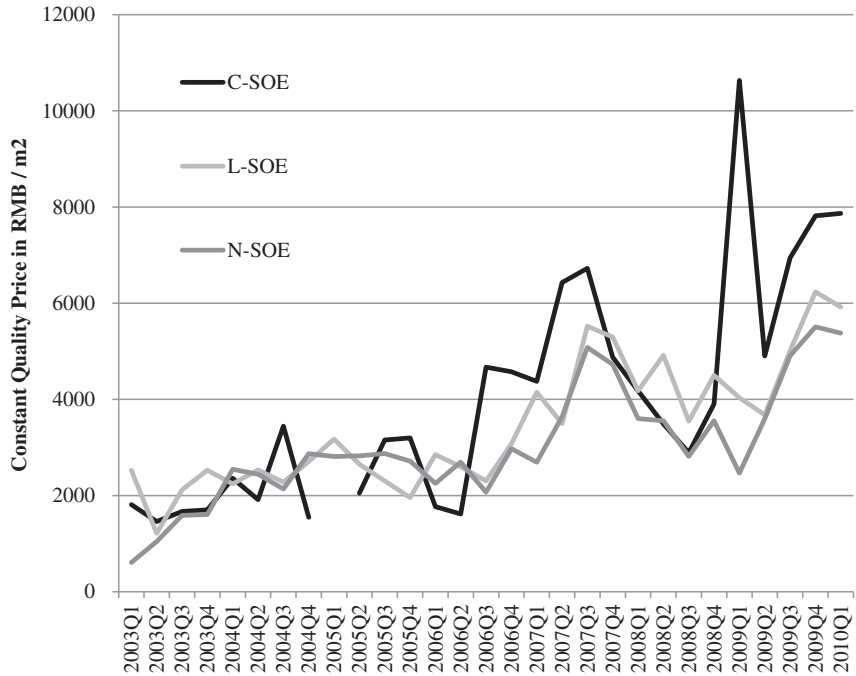

Figure 8. Constant quality residential land prices paid, by buyer type. A model similar with that in Table IX is estimated. Dependent variable is log of land price per square meter of permitted housing floor area. The C-SOE and L-SOE dummies are introduced as cross terms with time dummies. Other right-hand side variables are consistent with those in Table IX. A bundle of typical land parcel attributes are then adopted to predict the constant quality land price for each buyer type.

macroeconomic stimulus began. Moreover, locally controlled SOEs should also have connections, especially with the local authorities regulating real estate developments. Had connections suddenly become a major advantage to SOE real estate developers in 2009, L-SOEs would have responded too; but the results show no such effect.

Conceivably, the value of SOEs' connections might have lain dormant until 2008, when the C-SOEs were suddenly inundated with unprecedented quantities of cheap loans, and pressured to invest it quickly. Location is important in real estate, and SOE executives' connections are likely to be especially useful in the cities that host their headquarters. Indeed, access to local networks is thought important in explaining agglomeration in developed economies (Ellison and Glaeser, 1999). Panel B in Table X investigates this by including interactions to see if C-SOEs pay more for land nearer their headquarters. This is observed, but the stimulus effect remains

Table X. Robustness checks

The sample is all land transactions from the first quarter of 2003 to the first quarter of 2010 in eight major cities, as described in Table V. The dependent variable is the natural log of land price per square meter of permitted housing floor area. The control variables include city dummies, quarter dummies, and developer grade dummies are included in all specifications as in Table IX. The residuals are clustered by city and quarter simultaneously; the results are robust if clustering only by city or by quarter.

Panel A: timing of C-SOE developer price effect

STIMULUS is an indicator variable set to zero before the first quarter of 2009 and to one in that quarter and thereafter.

Notes: ***significant at the 1% level; **significant at the 5% level; *significant at the 10% level.

	(1)		(2)		(3)	
CSOE	0.09	(0.86)	0.05	(0.54)	0.16	(1.87)*
CSOE x STIMULUS	0.20	(2.21)**	0.19	(2.37)**	–	–
LSOE	0.12	(1.60)	–	–	0.12	(1.73)*
LSOE x STIMULUS	−0.01	(−0.12)	–	–	−0.03	(−0.44)
Control variables	Yes		Yes		Yes	
Adjusted R^2	0.62		0.62		0.62	
Observations	3,478		3,478		3,478	

Panel B: timing of C-SOE developer price effect

As proxies for the likely strength of "connections" between the C-SOE's top executives and the authorities regulating real estate development, we include *LOCAL*, an indicator variable set to one if the land purchased is in the same city as the C-SOE's head office and to zero otherwise, and log(*DISTANCE*), the logarithm of the distance in kilometers between the C-SOE's head office and the city in which the land purchased is located.

Notes: ***: significant at the 1% level; **: significant at the 5% level;*: significant at the 10% level.

	(1)		(2)		(3)		(4)	
CSOE	0.04	(0.38)	0.38	(3.40)***	0.03	(0.37)	0.38	(3.39)***
CSOE x LOCAL	0.31	(4.19)***			0.31	(4.11)***		
CSOE x log(*DISTANCE*)			−0.05	(−3.08)***			−0.05	(−3.05)***
CSOE x STIMULUS	0.18	(2.19)**	0.16	(1.85)*	0.18	(2.49)**	0.16	(2.11)**
LSOE	0.12	(1.70)*	0.12	(1.71)*	0.12	(2.33)**	0.12	(2.34)**
LSOE x STIMULUS	−0.01	(−0.17)	−0.01	(−0.18)				
Control variables	Yes		Yes		Yes		Yes	
Adjusted R^2	0.63		0.63		0.63		0.63	
Observations	3,478		3,478		3,478		3,478	

Panel C: additional control variables

Column (1) includes interactions between *STIMULUS* and each control variable to allow for post-stimulus shifts in the hedonic regression parameters. Column (2) includes as additional control the distance to the nearest subway station (*D_SUBWAY*), and is estimated on data for the five of our eight cities that have operating subway systems.

Notes: ***significant at the 1% level; **significant at the 5% level; *significant at the 10% level.

	(1)		(2)	
CSOE	0.09	(0.84)	0.17	(1.23)
CSOE x STIMULUS	0.20	(2.75)***	0.18	(1.93)*
LSOE	0.13	(1.94)*	0.11	(1.45)
LSOE x STIMULUS	−0.05	(−0.90)	0.01	(0.10)
log(*D_SUBWAY*)	–	–	−0.10	(−3.76)***
Control variables		Yes		Yes
Control variables *x STIMULUS*		Yes		No
Adjusted R^2		0.62		0.62
Observations		3,478		1,875

Panel D: listed versus unlisted firms

Buyers are partitioned into six groups: listed CSOEs, unlisted CSOEs, listed LSOEs, unlisted LSOEs, listed non-SOEs, and unlisted non-SOEs. In column (2), the interaction terms between *STIMULUS* and each group dummy are included.

Notes: ***: significant at the 1% level; **: significant at the 5% level;*: significant at the 10% level.

	(1)		(2)	
Listed CSOE	0.32	(3.65)***	0.25	(2.24)**
Listed CSOE x STIMULUS	–	–	0.21	(2.23)**
Unlisted CSOE	0.09	(0.90)	0.03	(0.31)
Unlisted CSOE x STIMULUS	–	–	0.38	(2.32)**
Listed LSOE	0.15	(2.53)**	0.17	(2.02)**
Listed LSOE x STIMULUS	–	–	−0.05	(−0.42)
Unlisted LSOE	0.18	(2.63)***	0.17	(2.04)**
Unlisted LSOE x STIMULUS	–	–	0.04	(0.54)
Listed Non-SOE	0.22	(5.26)***	0.18	(2.38)**
Listed Non-SOE x STIMULUS	–	–	0.14	(1.19)
Control variables		Yes		Yes
Adjusted R^2		0.62		0.63
Observations		3,478		3,478

significant. Thus, even though connections may indeed help C-SOE land developers, these results reaffirm a transmission role for C-SOEs in the macroeconomic stimulus.

A related concern is that location-specific economic factors might raise land prices in specific cities (e.g., Beijing) after the stimulus package, and that our observed result might therefore be spurious. Our inclusion of city and quarter dummies mitigates this problem. However, a more complete mitigation of this concern is to allow for shifts in the hedonic regression parameters after the stimulus. We therefore also introduced interaction terms between the *STIMULUS* dummy and all the land attributes. As shown in the first column of Panel C in Table X, our results remain robust.

Another possibility is that we control imperfectly for land parcel quality, and C-SOEs might be disproportionately purchasing higher quality land after 2008. We therefore consider additional variables in our hedonic regressions. Beijing, Shenzhen, Shanghai, Tianjin, and Wuhan have subways, so we introduce the logarithm of the distance to the nearest subway station as another quality measure and rerun our regressions using only data from these five cities. The second column of Panel C in Table X shows that this exercise generates qualitatively similar results.

Finally, listed and unlisted firms may behave differently. To explore this, we further partition the buyers into six groups: listed C-SOEs, unlisted C-SOEs, listed L-SOEs, unlisted L-SOEs, listed non-SOEs, and unlisted non-SOEs. The second column of Panel D in Table X shows that, after the stimulus, the price premium became larger for purchases by both listed and unlisted C-SOEs, but not for the other four groups.

6. Macroeconomic Impact and Efficiency

China's SOEs may well constitute an effective macroeconomic policy transmission channel through which the government can rapidly boost lending and investment. However, a range of government-failure problems render lending by SOE banks and investment by SOEs relatively inefficient (Shleifer, 1998; La Porta, Lopez-De-Silanes, and Shleifer, 2002; Morck, Yavuz, and Yeung, 2011), and an abrupt burst of SOE investment in response to central government pressure may well exacerbate this inefficiency. If so, the short-term stabilization benefits of more efficacious monetary policy must be balanced against the longer-term costs of this inefficient capital allocation.

Capital assets are investments whose returns accrue over the long run, so the costs of inefficient capital allocation may not be evident immediately.

Our data suggest that the SOE monetary stimulus likely elevated land lease prices and real estate construction relative to what they would otherwise have been. In China, what they would otherwise have been is likely far from any efficient market equilibrium, so concluding that this monetary stimulus made overall capital investment less socially efficient is obviously speculative at best.

Hundreds of millions of Chinese still live in very basic housing, so a burst of new residential unit construction is not obviously social welfare decreasing. Land lease prices (Wu, Gyourko, and Deng, 2012) and quality-adjusted new home prices (Wu, Deng, and Liu, 2014) rose far faster than household income, especially in the coastal "superstar" cities. This made property owners nominally wealthier, but raised mortgage or rental costs for others (Wu, Gyourko, and Deng, 2012). This wealth redistribution thus accelerated China's rising inequality. Again, the social welfare consequences of this are ambiguous. The improved access to quality housing for China's masses that a housing construction boom might have allowed remains pending. Moreover, the social welfare consequences of unequal access to housing may extend far beyond the merely pecuniary. For example, China's skewed sex ratio lets increasingly picky females make owning a home a basic marriage market entrance qualification for males (Wei and Zhang, 2009).

In part at least, the boom in residential construction has yet to translate into better housing for China's masses because many new units remain vacant. This is not because the units all remained unsold. From 1988, real estate transactions rose 40% to 2009, when a record 8.04 million newly built housing units were sold, and then set another record in 2010, 8.81 million units sold.[21] Rather, it appears that Chinese households hold many of these units as a form of savings, rather than as living space.[22] However, as recent American economic history makes clear, residential housing is not a risk-free asset, and an abrupt drop in home prices can substantially decrease homeowners' wealth, reducing their consumption, magnifying their debt-to-wealth ratios, and leaving the economy with a surfeit of unprofitable housing

[21] Source: National Bureau of Statistics, China.

[22] So far there is no reliable statistics on housing vacancy rate in China. But there are several well-known cases of "ghost city" like Ordos, an emerging city in Inner Mongolia, where most newly built and sold. Housing units are left vacant. See the report from *Wall Street Journal* ("China's Bind: How to Avoid a Crash Landing", December 2nd, 2011) for more details. Another potential problem is the housing oversupply right after the booming period. When a great number of enterprises were attracted to the housing development sector, the volume of housing starts in the national level boomed from 116.4 million square meters in 2009 to 163.6 million in 2010, a 40% jump. Source: National Bureau of Statistics, China.

developments. Perhaps such developments would force vacant units onto the resale market at low prices, effecting an equality-increasing wealth transfer. However, again, the social welfare consequences of such developments are not obviously positive.

A final social welfare consideration is the importance of land lease sales as a source of revenue for local governments. China's central government collects taxes and charges local governments with providing a broad range of public goods, but does not transfer to them tax revenues commensurate with these responsibilities. The result was a rising local government fiscal gap. Indeed, the fiscal gap rose over six-fold from 2008 to total RMB 0.78 trillion in 2009, before retreating to RMB 0.65 trillion in 2010 as the recovery began boosting the central government's tax revenue.[23] Local governments filled this gap from two sources: land lease sales and borrowing that pledged future land lease sales revenue as collateral. Thus, their revenues from land lease sales rose over 60% from 2008 to RMB 1.42 trillion in 2009 and then to RMB 2.91 trillion in 2010.[24] According to National Audit Office of China, local government year-end debt rose from RMB 5.56 trillion in 2008 to RMB 9.00 trillion in 2009, RMB 10.72 trillion in 2010 (26.7% of GDP), RMB 15.89 trillion (30.6% of GDP) in 2012, and RMB 17.89 trillion (31.7% of GDP) in 2013.[25] Arguably, elevated land lease prices associated with the stimulus sustained local government finances and the public goods those governments provide. But once more, the social welfare consequences are ambiguous: a dependence on land sales makes local governments vulnerable to a land lease price collapse, which would compromise both their direct revenues and borrowing capacities.[26]

7. Conclusion

China's macroeconomic stimulus had an extraordinarily large and rapid apparent impact. This reflects the central government's continued direct controls over much of the economy. The central government ordered its SOE banks to lend, and they lent; but primarily to the central government's nonfinancial SOEs. The central government ordered its nonfinancial SOEs

[23] Source: National Bureau of Statistics, China.

[24] Source: Ministry of Finance, "Annual Report of 2010 to National Peoples' Congress".

[25] Source: National Audit Office of China, December 2013.

[26] On June 10th, 2010, the State Council issued the document of "Circular on Issues Concerning Strengthening Management of Local Government-backed Financing Platform Companies" (Decree 2010[19]) to control the further expansion of local governments' debt, following by several documents by Peoples' Bank of China and China's Banking Regulation Commission.

to invest, and they invested; but primarily in real estate. This increased GDP substantially and rapidly in 2009, effectively countering the effects of the global financial crisis that affected many other countries that year.

However, the success of this stimulus may well disguise a curse. The economic logic behind a monetary stimulation is to keep credit flowing to economically viable firms by countering banks' tendency to tighten credit constraints during a downturn. The Chinese stimulus, in contrast, strengthened the flow of credit into already cash-flush C-SOEs, which were almost certainly not credit constrained at the time.

Two conclusions follow. First, China remains fundamentally a command and control economy, despite its seemingly rapid embrace of markets. Compared with most developed economies and most other emerging economies, the Chinese economy remains subject to remarkably sweeping direct control by the central government. While other governments must rely on "jawboning" and interest rate signals to stimulate lending and investment, China's government can simply decree that its SOEs effect a macroeconomic stimulus. The "Chinese model" of economic development, with the Communist Party retaining the economy's commanding heights, has generated three decades of rapid growth. To the extent that such "ordered up" lending and investment artificially accelerated real estate investment and elevated real estate prices above fundamentals, a major misallocation of the economy's resources may have ensued. This may brake future growth.

Second, the macroeconomic effectiveness of expansionary monetary policy depend, in the long run, on sustained microeconomic efficiency. The microeconomic implications of China's "ordered up" macroeconomic stimulus are unclear, but our first pass over the figures suggests at least the possibility of a distortionary inflation of real estate prices in some cities after stimulus.

Third, this form of monetary stimulus may create financial strain. A subsequent reversion in real estate prices in China is unlikely to trigger large-scale SOE defaults. This is because the C-SOE banks that abruptly upped their lending and the nonfinancial C-SOEs that recycled those loans into real estate remain cash flush. Moreover, a collapse in land prices would harm nonfinancial C-SOEs' balance sheets only if they need to mark their assets to market. Avoiding this might conceivably cause C-SOEs to hold empty real estate developments, rather than sell them and realize losses. Realized losses would not only show up on their balance sheets, but would also reduce earnings and thus CEO compensation. Such an unwillingness to sell properties whose values fall below their costs, if widespread, could prolong disequilibrium in the housing market, keeping large swathes of real estate vacant amid a housing shortages. Also, widespread mortgage

defaults by home buyers are unlikely because required down payments ranged from 30% to 40%. Homeowners might take capital losses, but would not profit from abandoning their investments unless the prices collapsed utterly. Finally, home ownership in China opens access to social benefits, such as schools, and contributes to one's social status. Such considerations make mortgage defaults costly, even if the mortgage is "underwater"—that is, even if property values fall below outstanding mortgage debts.

Nonetheless, financial strains may take other forms. First, a reversion in real estate prices means declining revenues from land lease sales revenues for local governments, tightening their budgets and reducing their debt capacities. Pressures on local sovereign debt are thus possible. Second, the real estate is now an important part of the wealth of many Chinese people. Chinese still have access to only a very limited range of saving and investment instruments: essentially only bank accounts, domestic stocks, and real estate. By storing much of their wealth in real estate, many households have become house price dependent and vulnerable to a negative wealth effect should real estate valuations drop. Thus, while a drop in house prices would likely not irreparably damage financial or nonfinancial C-SOE, it could adversely affect local governments and household wealth. Either could become a sustained drag on aggregate demand.

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