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MONETARY AND FISCAL STIMULI, OWNERSHIP STRUCTURE, AND CHINA'S  
HOUSING MARKET

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**ABSTRACT**

In the recent financial crisis, macroeconomic stimuli produced mixed results across developed economies. In contrast, China's stimulus boosted real GDP growth from an annualized 6.2% in the first quarter of 2009 trough to 11.9% in the first quarter of 2010. Amidst this phenomenal response, land auction and house prices in major cities soared. We argue that the speed and efficacy of China's stimulus derives from state control over its banking system and corporate sector. Beijing ordered state-owned banks to lend, and they lent. Beijing ordered centrally-controlled state-owned enterprises (SOEs) to invest, and they invested. However, our data show that much of this investment was highly leveraged purchases of real estate. Residential land auction prices in eight major cities rose about 100% in 2009, controlling for quality variation. Moreover, higher price rises occur these SOEs are more active buyers. We argue that these centrally-controlled SOEs overbid substantially, fueling a real estate bubble; and that China's seemingly highly effective macroeconomic stimulus package may well have induced costly resource misallocation.

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## 1. Introduction

The 2008 financial crisis that originated in the U.S. triggered a global recession. Central banks and governments worldwide reacted with monetary and fiscal policy interventions. Researchers at the Brookings Institute estimate fiscal stimuli in the G-20 countries reaching US\$692 billion in 2009 – roughly 1.4% of their combined 2008 gross domestic product (GDP) and about 1.1% of global GDP (Prasad and Sorkin 2009). IMF (International Monetary Fund 2009) estimates are similar, and peg China's package at about 2% of its 2009 GDP.

These government actions renewed debate about the efficacy of such stimuli as remedies for recession. Feldstein (2009) sees credit markets in U.S. and some other developed countries as too deeply wounded by the subprime mortgage crisis to be able (or willing) to advance credit in response to interest rate reductions by monetary authorities. If so, monetary stimulation alone ought not to work, even in the short-run. When monetary policy's effectiveness is uncertain, fiscal stimuli – tax cuts, government spending hikes, or both - can come to the rescue if the Keynesian multiplier exceeds one. Christine Romer, the chair of U.S. President Obama's Council of Economic Advisers, estimates the U.S. stimulus achieving a multiplier of about 1.6,<sup>1</sup> but other prominent economists, such as Robert Barro<sup>2</sup> and John Cochrane<sup>3</sup>, estimate a multiplier below one.

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<sup>1</sup> Christine Romer. "On the Advance Estimate of GDP for the Fourth Quarter of 2009," Jan 29, 2010. [www.whitehouse.gov/blog/2010/01/29/advance-estimate-gdp-fourth-quarter-2009](http://www.whitehouse.gov/blog/2010/01/29/advance-estimate-gdp-fourth-quarter-2009). .

<sup>2</sup> Robert Barro, "The Stimulus Evidence One Year On," Wall Street Journal, Feb 23, 2010.

<sup>3</sup> John H. Cochrane, "Fiscal Stimulus, Fiscal Inflation, or Fiscal Fallacies?" Feb 27, 2009. [faculty.chicagobooth.edu/john.cochrane/research/Papers/fiscal2.htm](http://faculty.chicagobooth.edu/john.cochrane/research/Papers/fiscal2.htm).

The literature provides mixed theoretical and empirical evidence on the efficacy of stimulus packages in developed economies. Early empirical work reports multipliers above one (Rotemberg and Woodford 1992; Blandhard and Perotti 2002; Gali, Lopez-Salido and Valles 2007), but more recent work reports multipliers near or below unity, challenging the wisdom of all the recent government stimuli. Barro and Redlick (2009) discount earlier multiplier estimates as biased because of business cycle endogeneity, and argue that a focus on defense spending allows a cleaner estimate – which turns out to be below one under most conditions. This accords with estimates by Edelberg, Eichenbaum and Fisher (1999), Burnside, Eichenbaum and Fisher (2004), and others. Ramey (2009) estimates the multiplier as lying between 0.6 and 1.1, and criticizes larger estimates as biased due to model misspecification. Freedman *et al.* (2009) show a wide range of short-run (two years) multipliers, ranging from 0.2 to 2.2 in the United States; but stress that government spending hikes almost always beget fiscal deficits and therefore reduce long run output. The efficacy of tax cuts is also uncertain. Barro and Redlick (2009) estimate that a one percentage point cut in the mean marginal tax rate raises the subsequent year's GDP growth rate by about 0.6%. However, Feldstein (2009) estimates a much weaker response - a marginal propensity to consume from tax cuts of only 0.13. Debates in other countries echo that in the U.S.

The Chinese government's stimulus in the wake of the 2008 crisis wrought a large and almost immediate response. Beijing announced its stimulus package in the 4<sup>th</sup> quarter in 2008 and annualized real GDP growth rates in the four quarters of

2009 rose steadily and substantially: 6.2%, 7.9%, 9.1% and 10.7%, respectively; and 11.9% in the first quarter of 2010.

China's stimulus contained both monetary and fiscal elements. In the 4<sup>th</sup> quarter of 2008, the government announced a monetary policy shift from "moderately tight" to "moderately loose". The annualized real money supply (M2) growth rate rose from 14.9% in 2008 Q4 to 26.2% in 2009 Q1 and then 30.4% in 2009 Q2, while the annualized real growth rate in total loan balances rose from 13.1% to 27.9% and then 33.9% in the same intervals (Figure 1). In comparison, the average real annual growth rates in M2 and loan balances from 2000 to 2008 averaged 14.5% and 11.8%, respectively. The fiscal stimulus, a government spending package of RMB4 trillion (about US\$586 billion) began in November 2008 and was to be spent over the next two to three years.<sup>4</sup> Thereafter, the annualized real growth rate in fixed capital assets investment rose from 20.27% in 2008 Q4 to 29.42% in 2009 Q1 and then 38.03% in 2009 Q2 (Figure 2). Gross capital formation contributed over 90% (a historic peak) of China's GDP growth in 2009.<sup>5</sup>

**===Insert Figure 1 about here===**

**===Insert Figure 2 about here===**

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<sup>4</sup> Actual spending by the Chinese central government may well be less than announced figures. The official figure for 2009, announced in a March 2010 speech to the National Peoples' Congress by Premier Wen Jiaobao, is only RMB924.3 billion (ca US\$135.4 billion). Even this may be too high: Prasad and Sorkin (2009) estimate that the central government spent only US\$90.1 billion that year.

<sup>5</sup> Source: National Bureau of Statistics, "2010 Statistics Yearbook of China".

The sheer magnitudes of China's stimulus package do not explain its remarkable impact. China's monetary policy was not distinctly extreme: its lowest benchmark interest rate during the downturn period was 2.25%, and this was not lower than in most other economies. Prasad and Sorkin (2009) classify the fiscal stimulus packages of China, Saudi Arabia, South Africa, and the United States as "large" compared to those of other G20 countries; but estimate America's fiscal stimulus, US\$841.2 billion or 5.9% of GDP, dwarfing China's comparatively paltry US\$204.3 billion or 4.8% of GDP. The IMF (2009) estimates are more comparable: 4.8% and 4.4% of GDP for America's and China's fiscal stimuli, respectively. Thus China's fiscal stimulus was clearly not larger than America's, and was probably somewhat smaller.

China's economic strength coming out of the global recession is also clearly not due to an undervaluation of its currency stimulating exports. Despite the recent debate over China's exchange rate policy, and irrespective of whether or not a low RMB subsidizes exports, Chinese net exports fell 44.8% in 2009. The Chinese government estimates that this contracted the economy by roughly 3.9% of GDP.<sup>6</sup> Thus, China's stimulus package took effect as the country's exports were falling precipitously.

We offer a new explanation of the effectiveness of China's stimulus package based on the corporate governance of its banks and major non-financial enterprises. Specifically, we propose that the extraordinarily fast and large response to the

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<sup>6</sup> Source: National Bureau of Statistics, "2010 Statistics Yearbook of China".

government's stimulus policies reflects the central government's direct control over major banks and largest non-financial enterprises, all of which are state-owned enterprises (SOEs). China's SOE banks increased lending dramatically and immediately upon the government's announcement of its stimulus policies, and China's state-owned non-financial enterprises launched vast new investment plans at exactly the same time.

We argue that these lending and investment decisions generally do not seek to optimize the firm-level financial interests of China's banking and nonfinancial SOEs, as microeconomic theory posits should occur in a market economy. Rather, they reflect direct political control by the government over banks and corporate borrowers. If so, the speed and efficacy of China's stimulus policies may well be part of what is sometimes called the "policy burden" (Lin, Cai and Li, 1998; Lin and Tan, 1999; Lin and Li, 2008) or "multitasking" (Bai et al, 2000; Bai, Lu and Tao, 2006) the government assigns to SOEs. Such direct intervention in bank lending and corporate investment decisions may let China's government lift its economy out of a low-level equilibrium more neatly than other countries could manage. But the drafting of banks and non-financial in a forced march towards higher GDP may also misallocate capital, inducing a recovery without lasting economic foundations.

Major lending initiatives require substantial due diligence and financial analysis by banks, and major capital spending initiatives entail substantial planning and preparation by enterprises. This requires expertise, time, and resources – especially in a rapidly changing economic environment. Ordered to boost lending,

China's SOE bank managers were understandably reluctant to lend to private-sector entrepreneurs, and so proffered loans to nonfinancial SOEs, whose official connections substantially reduce their perceived default risk.

Major capital investment outlays also require intricate cost-benefit studies, forecasts of important parameters like demand and factor costs, and risk analysis. This too requires expertise, time, and resources – especially in an uncertain economic environment. China's SOE managers, ordered to boost investment, were understandably hesitant to make intrinsically largely irreversible investments in property, plant, and equipment. Instead they needed quick and reversible investments. We show that they poured the proceeds of their loans from SOE banks into real estate purchases, which count as corporate investments in official statistics.

Consistent with this, the State-owned Assets Supervision and Administration Commission (SASAC) of the State Council (federal government) reports numerous SOEs, especially very large SOEs controlled directly by the central government (hereinafter "C-SOEs"), suddenly expanding housing development activities in 2009. Using parcel-level land auction data, and adjusting for parcel quality using location and physical attribute data, we find a 97.4% increase in real land prices in eight major Chinese cities in 2009. The fraction of the total value of residential land purchases made by C-SOEs jumped from 15% prior to 2008 to 23% in 2009 and 33% in 2010 Q1. We further estimate that, controlling for land parcel attributes and time fixed effects, C-SOEs paid 16% more than other land buyers. Moreover, these



effects are evident after the government's stimulus package announcement, but not before. These findings are consistent with C-SOEs overpaying for land in a scramble to invest quickly – though the bid premium associated with C-SOEs' may be partially attributable to lower capital costs, and might also be justifiable in that their political connections might let C-SOEs glean greater revenue from development projects than other developers could.

The paper 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 banks and SOEs' role the roles of banking and nonfinancial SOEs in the stimulus policies, and argues that an SOE channel is important to Chinese macroeconomic policy. Section 4 introduces the land transaction data for empirical tests, and section 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 Regarding Chinese Banks and Large Non-financial 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.<sup>7</sup> In 1978, when economic reforms began, SOEs accounted for 78% of total industrial output and 64% of urban employment, and during 1975-1980 SOEs accounted for over 84% of new investment in industrial fixed assets (Chiu and Lewis, 2006; Brandt, Rawski and Sutton, 2008).<sup>8</sup>

After the mid-1980s, reforming SOEs became a major policy focus, and actual reforms occurred in three phases. We briefly review the first two, which are discussed in detail elsewhere (e.g. Qian, 2000; Chiu and Lewis, 2006; Brandt, Rawski and Sutton, 2008). Our focus is the third phase, which clarifies SOEs' role in the government stimulus packages.

The first phase, from the mid-1980s to the mid-1990s, expanded SOE autonomy and surrounded 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 to most small- and medium-size SOEs, under which SOE managers signed contracts with the government. These gave managers considerable

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<sup>7</sup> For more details about SOEs during the planned economy era, see Chiu and Lewis (2006) and Brandt, Rawski and Sutton (2008).

<sup>8</sup> Most of the remaining was by local government-controlled collectives.

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*), many small- and medium-size SOEs were assessed for reorganization, bankruptcy, 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.

Despite SOEs, especially large ones, having privileged access to inputs, capital, and markets; many continued performing poorly at the end of the 20<sup>th</sup> century – most likely because of a mixture of poor governance, under-developed management skills, and heavy "policy burdens" that commandeered SOEs to fulfill government policy agendas, distorting their production decisions and general operations (Lin and Tan, 1999; Lin and Li, 2008). The central government billed the decade from 1993 to 2002 as "the most difficult period for the SOEs."<sup>9</sup> During the economic downturn of 1998, more than two thirds of industrial SOEs ran deficits, and SOEs' country-wide mean return on assets (ROA) was only about 0.7%.<sup>10</sup> SOEs were called the "Achilles heel of China's otherwise remarkable economic performance"

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<sup>9</sup> Source: "Thirty Years of SOE Reform", [http://www.gov.cn/ztl/2008-10/02/content\\_1110911.htm](http://www.gov.cn/ztl/2008-10/02/content_1110911.htm).

<sup>10</sup> Source: National Bureau of Statistics, China.

(Broadman, 2001) and "threaten[ed] to drag down the nation's entire economy" (Steinfeld, 1998).

The third phase of SOE reforms started in 2003, after the November 2002 16<sup>th</sup> National Congress of the Chinese Communist Party (CCP). This era is the focus of our study. In this third phase, 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 Figure 3 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.

**===Insert Figure 3 about here===**

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 related institutional structures. 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 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 majority (over 50% of shares) owner.

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 Wen Jiabao promised at the founding of the State Council SASAC that the SASACs would not become SOEs' "mothers-in-law" (*po po*) – a 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.<sup>11</sup> 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, 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 the Chinese Communist Party (CCP). The top positions that also require Party approval include the chair of the board, chief executive officer (CEO), deputy CEO, and any other key position the CCP Organization Department considers important. Most recently, the "Interim

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<sup>11</sup> 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.

Provisions on Management of Executives in C-SOEs", issued jointly by the Central Committee of CCP and the State 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."<sup>12</sup> 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

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<sup>12</sup> Source: "Interim Provisions on Supervision and Administration of State-owned Assets of Enterprises" (State Council's Decree 378, 2003).

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.<sup>13</sup>

In theory, this directly links the income of an 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 three-years, and disbursed completely only if the executive gets at least a C grade in the triennial evaluation.<sup>14</sup> 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 business.

The grades an SOE executive attains also affect his subsequent career path. But, as noted above, the SASAC makes recommendations regarding SOE executives' promotions at their triennial evaluations. The Organization Department of the CCP then promotes, demotes, or laterally transfers 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.

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<sup>13</sup> Source: speech by Mr Li Rongrong, director of State Council SASAC in Jan 9, 2010.

<sup>14</sup> See the latest version of "Interim Provisions on Performance Evaluations for Executives of C-SOEs" (State Council SASAC Document 22, 2009) for more details.



The Organization Department of the CCP 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 CCP policies and harmonious cooperation advancing CCP priorities, or perhaps more accurately, obedience to senior government and Party officials' orders. A top SOE executive judged unresponsive to such direction risks not being promoted, or even being demoted at the end of his three-year term ends – even if his SOEs performs well. Kato and Lang (2004), 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 CCP, 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, three years of

good performance locks in the executive's bonuses and justifies a promotion by the CCP 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 quite ambiguous.

The overall effect of the SASAC reforms is thus a priori unclear. SOE top executives have greater autonomy than before, but are also likely under greater pressure. On the one hand, this pressure encourages better SOE performance because top executive compensation is more explicitly tied to SOE performance and, in the case of a few listed SOEs, share prices. On the other hand, this pressure subjects SOE top executives to more political interference because their career prospects depend on their loyalty to the Party and the government.

These dual criteria for evaluating SOE top executives – deliver profits and serve the government – can align if, as Deng Xiaoping proclaimed, "to be rich is glorious" (*zhi fu guang rong*). But if government 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 towards obedience to government directives, for the Organization Department of the CCP 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.

We believe that 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 1) 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 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 non-financial 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.

**===Insert Table 1 about here===**

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 some other

important industries (such as real estate, construction, and car manufacturing).<sup>15</sup> The 2008 Economic Census thus classifies only 3.15% of all enterprises as SOEs, but these contained 30.53% of total enterprise assets (Table 2). 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.

**===Insert Table 2 about here===**

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 large family controlled pyramidal 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 et al. 1999; Morck, Stangeland, Yeung 2000). However, the structures being organized in China 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 may aggregate to a control block.

The 142 C-SOEs still extant in 2008 controlled 19,250 other enterprises. Of these, 8,524 are wholly state-owned; another 9,534 are listed as state-controlled;

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<sup>15</sup> Source: State Council. "Guidelines of State-Owned Enterprises Reform" (Decree 97, 2006), Dec. 5, 2006.

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. 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.<sup>16</sup> According to the State Council SASAC's statistics, nonfinancial C-SOEs accounted for about 40% of total nonfinancial SOE assets, over 60% of their sales, and over 70% of their profits 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 described above in connection with non-financial SOEs. In 2003, as the SASACs were founded, the China Banking Regulatory Commission (CBRC) was also founded to direct and supervise the operation of 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.

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<sup>16</sup> Source: State Council SASAC, "2009 Annual Report," Aug 3, 2010.

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. 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 are to be appointed directly by the State Council (Pistor 2010). Ownership and control thus appear fully separated. However, in practice, the Organization Department of the CCP actually appoints the top executives of Central Huijin and the CIC, and the CIC's portfolio is de facto an investments arm of the CCP; perhaps reuniting ownership and control at a more 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 banks' 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 CCP. Top executives at SOE banks thus confront the same dual goals of good firm performance and loyalty to government dictates that other SOEs contend with.

The People's Bank of China, the country's central bank, classifies banks by ownership structure. Three important banks – the 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 – the 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 holding sufficient equity blocks to lock in state 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.<sup>17</sup> Rural credit cooperation associations, city commercial banks, foreign banks, and certain other financial institutions fall outside these categories. Thus, eighteen of

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<sup>17</sup> 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.



the twenty 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 3).

===Insert Table 3 about here===

### **3. China's SOE Macroeconomic Policy Channel**

#### **3.1 *SOEs' Responses to Stimulus***

Figure 4 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.

Amid this drop in banker confidence, the government announced an expansionary shift in monetary policy; and China's four state-owned commercial banks and thirteen joint-stock commercial banks immediately initiated a huge volume of new loans in the 1<sup>st</sup> quarter of 2009 (Figure 4). The four state-owned commercial banks' total loan balance rose by RMB2.31 trillion in that quarter, substantially more than the 1.80 trillion increase over the entire year of 2008, and increased by RMB4.10 trillion over the full year of 2009. This raised their share of total loan volume 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 RMB1.18 trillion in the 1<sup>st</sup> quarter of 2009 and RMB2.23 trillion over in that whole year.

**===Insert Figure 4 about here===**

The global downturn also hurt non-financial SOEs badly. State Council SASAC's statistics for 2008 show non-financial SOEs' profits decreased by 24.5% at the national level, with 45.5% of the SOEs suffering losses. Both ROS and profits were in deep troughs in 2008, and neither improved until 2009 Q3 (see Figure 5). The performance of C-SOEs, also tracked by the State Council SASAC, shows 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 6). Nonetheless, these too stepped forth to do their bit.

Non-financial SOEs responded to the government's call for economic stimulus with a prompt and substantial hike in investment. Prior to 2008, SOEs' annualized real growth rate in fixed asset investment typically lagged that of non-SOEs by about ten percentage points (Figure 6). But this growth rate increased 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, the SOEs' 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.

**===Insert Figure 5 about here===**

**===Insert Figure 6 about here===**

With banker and entrepreneur confidence indexes dragging at or near historic lows, and with banks and nonfinancial SOEs navigating through increasingly choppy business environments, these sudden 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 pursue these policies by the government.

The SASACs made "contributions to the stimulus plan" a new corporate performance objective, as highlighted in State Council SASAC's 2009 annual report, to be used in evaluating SOE executives; and most SOE banks' and nonfinancial enterprises' 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 CCP weighed obedience to Party thought heavily in promoting, renewing, or demoting SOE executives. Thus, responding quickly and meaningfully to the government's macroeconomic stimulus became an SOE's "policy burden" and an explicitly stipulated objective for SOE managers.

### **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 three-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.

For several reasons, bankers saw large C-SOEs as preferred borrowers. First, large C-SOEs were widely thought "too big to fail". If the downturn proved long and deep, the State was likely to save them from serious trouble. Second, lending to large C-SOEs was "politically correct." Nonperforming loans to other borrowers, especially private corporations, would leave SOE bankers open to criticism. But decisions to let SOEs, especially C-SOEs, renege on debts would be made by high government and party officials, sheltering SOE bankers from blame. Such

reasoning appears to have been persuasive, for listed C-SOEs received nearly 60% of all new loans to all companies listed in mainland exchanges in 2009.<sup>18</sup>

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 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 three 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.

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<sup>18</sup> Source: Author' calculation based on annual report data in the Genius Finance Database.

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 construction one of the most profitable industries. The two latest economic censuses show the ROS of the real estate sector rising faster than in 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". 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 most profitable sector, requires locating and developing ore deposits; and the sector is, in any event, given over to state-licensed monopolies. 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.

Accordingly, many C-SOEs, obeying political directives to hike their borrowing from SOE banks and invest, opted to invest real estate. While SASAC guidelines list only 16 C-SOEs with real estate development as core business, these and 78 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 madate, issued in 2002 and reiterated in 2004, requires that leases for urban lots designated for residential development be sold at auctions.<sup>19</sup> 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.<sup>20</sup>

Our data, from the Soufun Database and local land resources authorities' websites, contain 3,542 land transaction records.<sup>21</sup> 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

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<sup>19</sup> Three variants are permitted: one-stage auction, two-stage auction, and an alternative bidding process. See Cai, Henderson and Zhang (2009) for details.

<sup>20</sup> Calculation based on Nation Bureau of Statistics data and municipal statistics for each city.

<sup>21</sup> Soufun is a leading Chinese data vendor specialized in land and housing transaction data. The company's website is [fdc.soufun.com](http://fdc.soufun.com).

because their prices are determined using other mechanisms. 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 includes the period in which China's macroeconomic stimulus was in high gear, and in which C-SOE investment options were unrestricted. Table 4 describes the distribution of these transactions across the eight major cities we study.

**===Insert Table 4 about here===**

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 and, within each classification, assign the buyers grades, from one (highest) through five (lowest), according to size and experience as a developer. This also lets us distinguish listed from unlisted buyers. Table 5 displays the definitions and descriptive statistics of the variables so constructed.

**===Insert Table 5 about here===**



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 7 shows SOEs' market share as low, with non-SOE developers dominating the market, until 2008; after which SOEs, and especially C-SOEs rapidly become major players. C-SOE developers' share by total value rose from about 15% in 2008 to about 23% in 2009, and a historic high of about 33% in 2010 Q1.

**===Insert Figure 7 about here===**

Table 6 reveals substantial variation across cities in C-SOE entry. In Beijing, their favorite market, C-SOEs roughly doubled their market share from its historic level or roughly 24% to 53.54% in 2009 and 2010 Q1, when the stimulus package was unfolded. Simultaneous surges in market shares are also clearly evident in Shanghai, Chengdu, and Tianjin, but less so in the other four cities.

**===Insert Table 6 about here===**

## 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.<sup>22</sup> 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 (*LANDEVEL*), 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 auction and *BIDDING* for a bidding process, with two-stage auctions as the left-out category). All regressions include city and quarter fixed effects.

Table 7 reports the results of our basic hedonic model, estimated by OLS (column 1), sandwich estimator allowing for clustering by city (White 1980; column 2), and random effect regression (column 3), respectively.

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<sup>22</sup> 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.

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.

**===Insert Table 7 about here===**

The coefficients on the quarterly time dummies from column 2 of Table 7 are plotted in Figure 8; 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 4 shows beginning in 2009 Q1.

**===Insert Figure 8 about here===**

A near doubling of land price within one 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, *CSOE* and *LSOE*, 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 8 reports the results. Again, like in Table 7, all the three estimators are applied and the results are consistent. 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. The robust clustered sandwich estimator regressions (column2) show C-SOEs and L-SOEs paying 16% and 11% more, respectively, than non-SOE buyers for land parcels that are otherwise identical in terms of the characteristics we observe.

**===Insert Table 8 about here===**

These price premiums at least partially explain the surge we observe in residential land prices. Figure 9 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 C-SOE bids, other developers bids would surely be lower than those we observe.

==== Insert Figure 9 about here ====

### **5.3 *Robustness***

Other factors might contribute to C-SOE real estate developers' high bids. First, C-SOEs' connections have surely long provided privileged access to government funds, loans 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 9 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. Table 9 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 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 should have responded too; but Table 9 shows no such effect.

**==== Insert Table 9 about here ====**

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). Table 10 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 significant. Thus, Table 10 concedes that connections may indeed help C-SOE land developers, but reaffirms a transmission role for C-SOEs in the macroeconomic stimulus.

==== Table 10 about here =====

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. This exercise generates qualitatively similar results to those shown in the tables, by which we mean identical patterns of signs and significance levels and roughly comparable coefficient magnitudes.

Another approach to capture the effects of missing hedonic factors is to directly introduce the price of comparable newly-built housing units. We therefore match each land transactions in Beijing with the price of newly completed residential housing no more than five kilometers away and sold no more than twelve months earlier. This lets us match each of 296 land transactions to one or more of 907 completed residential housing developments. For each transaction, we take the average sale price during the previous month of housing units in the matched completed developments, weighted by the reciprocal of the distance. We then include this "neighborhood price" as an additional right-hand side variable. This exercise also yields qualitatively similar results to those shown.

## 6. Macroeconomic Impact of C-SOE Land Transactions

For SOEs to constitute a macroeconomic policy channel, their real estate investments and the associated surge in land prices must have a macroeconomic impact. Two direct effects contribute to GDP.

First, by increasing the overall value of land transactions, C-SOEs directly elevate aggregate investment and therefore GDP. To assess the importance of the real estate related sectors to GDP, we calculate what GDP growth would have been without the real estate related sectors.<sup>23</sup> For example, China's 2009 GDP growth was 9.3%, but would have been only 8.3% without real estate related sectors. In other words, the real estate related sectors were responsible for roughly 11% of total GDP growth. Figure 10 graphs this fraction by year, and shows the real estate related sectors' contribution to GDP growth peaking in 2009.

**===Insert Figure 10 about here===**

Second, revenue from land lease sales accrues to Chinese government. In 2009 total government spending grew by 23%, from RMB 6.26 trillion in 2008 to RMB 7.63 trillion in 2009; while total budgetary government revenues rose only 11.7% to RMB 6.85 trillion. This left Chinese government with an overall deficit of RMB 0.78 trillion, 6.2 times as much as that in 2008.<sup>24</sup> Governments' revenues from land sales – RMB 1.39 trillion in 2009, and up over 60% from the previous year, was thus

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<sup>23</sup> In the calculations, we define "real estate related sectors" as the aggregate of the real estate and construction industries.

<sup>24</sup> Source: National Bureau of Statistics, China.



an important factor in preventing a major contraction in government spending.<sup>25</sup>

Clearly, the hike in land auction income played a critical role in financing the fiscal stimulation policies for Chinese government.<sup>26</sup>

However, sustainably high GDP growth in the long run depends on the efficiency of resource allocation. Wu, Gyourko and Deng (2010) argue that Chinese land prices were already above fundamental values in some cities, notably Beijing, prior to the stimulus package, and that 2009 and early 2010 saw increasingly effervescent land prices. While this might increase nominal wealth for homeowners, and thus encourage them to increase consumption; it burdens others with larger interest payments, decreasing their quality of life. Moreover, as recent American macroeconomic events make clear, the implosion of a real estate price bubble decreases homeowners' wealth significantly, reduces their consumption, leaves people burdened with large debts, and leaves the economy with a surfeit of unprofitable housing developments. If China's macroeconomic stimulus via its SOE channel is merely replicating this effect, a truly epic tale of short-term gain for long-term pain may be unfolding.

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<sup>25</sup> Source: Soufun Database.

<sup>26</sup> More precisely, land auction income is especially important for financing local government since in China all land revenues accrue to local governments. In 2009 the overall deficit at local government level reached RMB2.8 trillion.

## **7. Conclusion**

China's macroeconomic stimulus had an extraordinarily large and rapid effect. 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 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 affect 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 fiscal and monetary policies 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 an expanding housing bubble in 2009 and 2010.

A sharp drop in housing prices in China is unlikely to trigger a financial crisis of the sort America recently experienced. 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. A collapse in land prices would harm their balance sheets, but is unlikely to damage them severely. In addition, widespread mortgage defaults by home buyers are unlikely because required down-payments ranged from thirty to forty percent. 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 somewhat "under-water" – that is, even if property values fall below outstanding mortgage debts.

Nonetheless, a sharp decline in house price would mean a sharp decline in 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 Chinese households have become house price dependent. While an abrupt collapse in house price would likely not irreparably damage C-SOE banks or nonfinancial C-SOEs with real estate operations, it would almost surely substantially decrease household wealth. This negative wealth effect could become a sustained drag on aggregate demand, possibly inflicting worse long-run damage on the Chinese economy than the recent crisis inflicted on the U.S. economy.

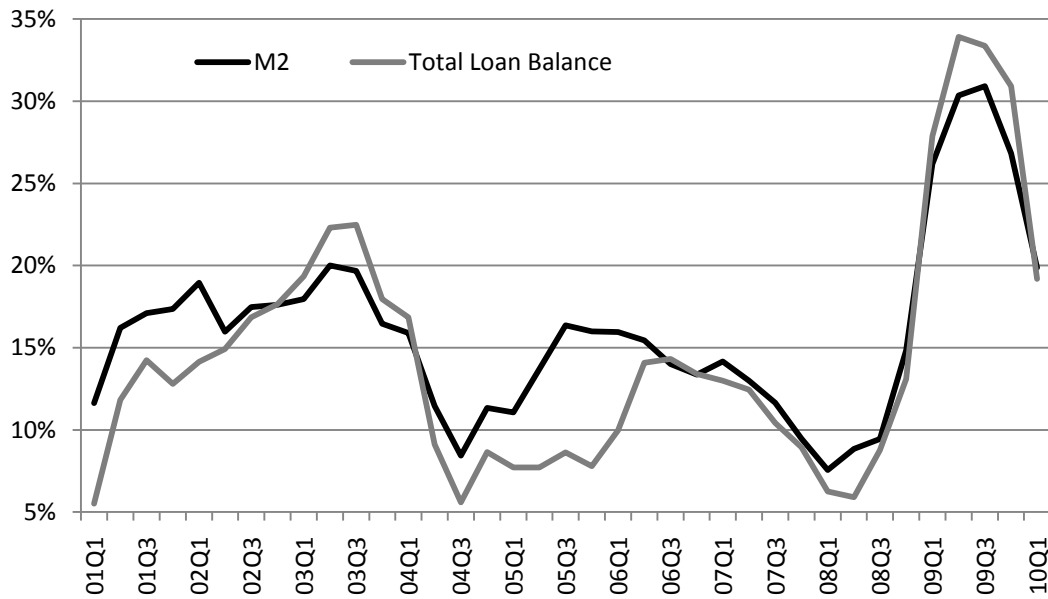
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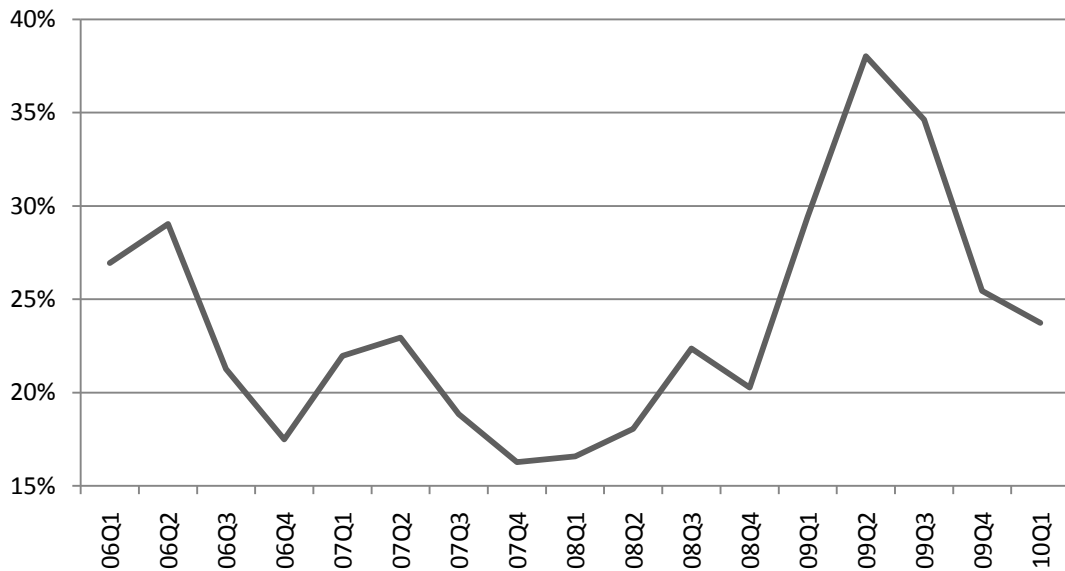
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**Figure 1: Annualized Real Growth Rate of M2 and Loan Balances**



Source: People's Bank of China (the central bank of China).

**Figure 2: Annualized Real Growth Rate of Investment in Fixed Assets**

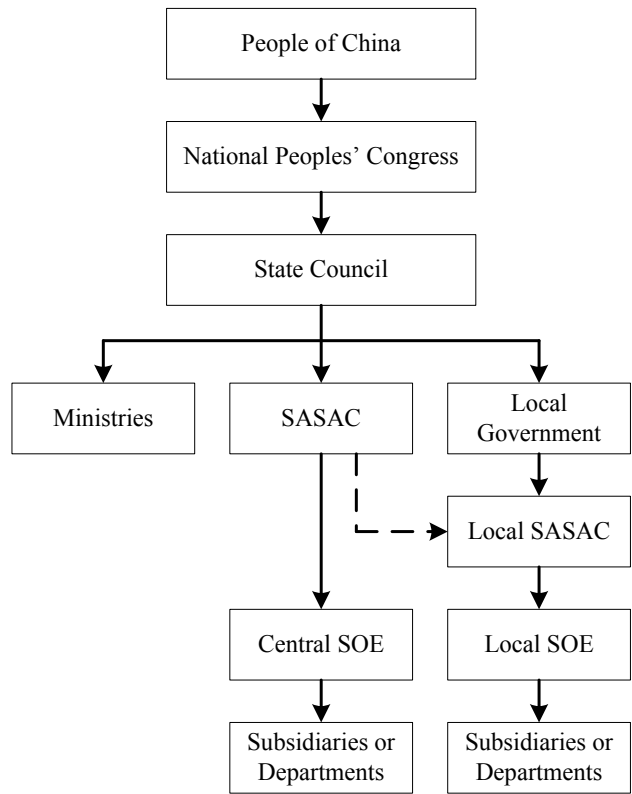


Source: National Bureau of Statistics, China.

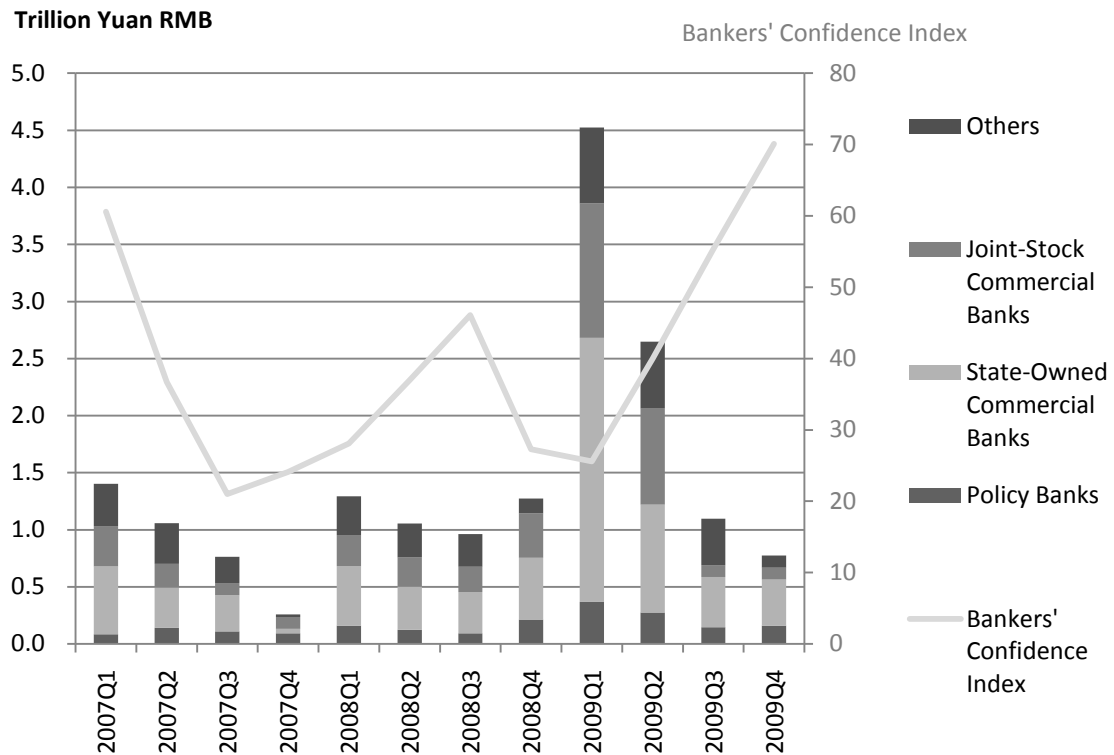


### Figure 3: Structure of SASAC Institutions

China's roughly 300 SASACs include the SASAC of the State Council, which supervises SOEs controlled by the national government; about 30 province-level SASACs, which supervise provincially-controlled SOEs; and numerous municipal SASACs, which supervise locally-controlled SOEs.

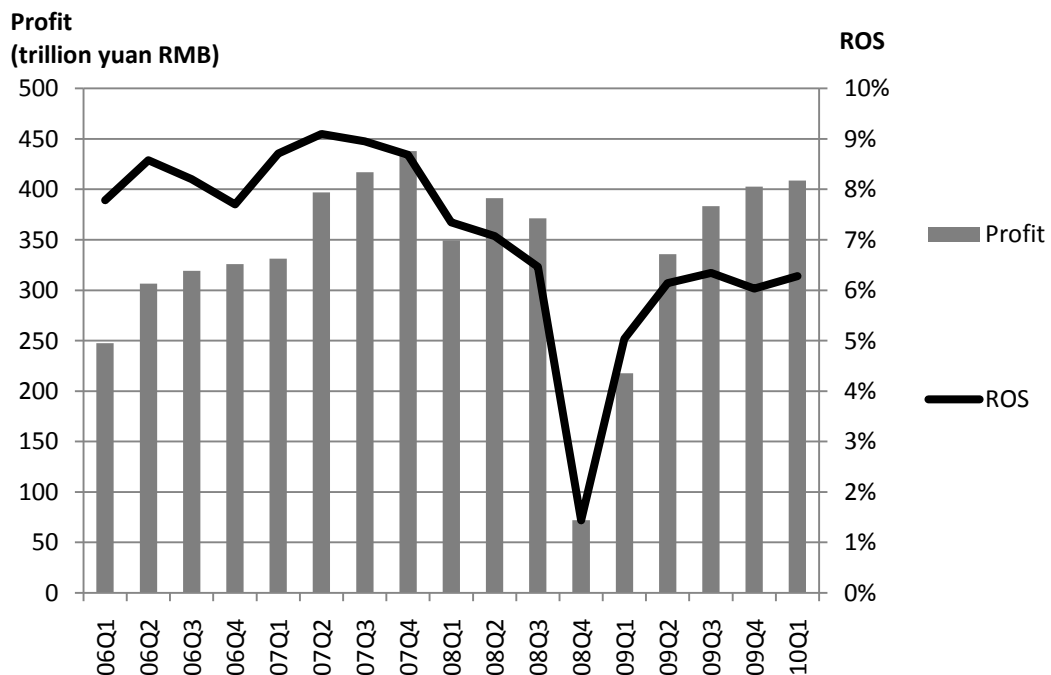


**Figure 4: Loan Balance Increments and Bankers' Confidence Index**



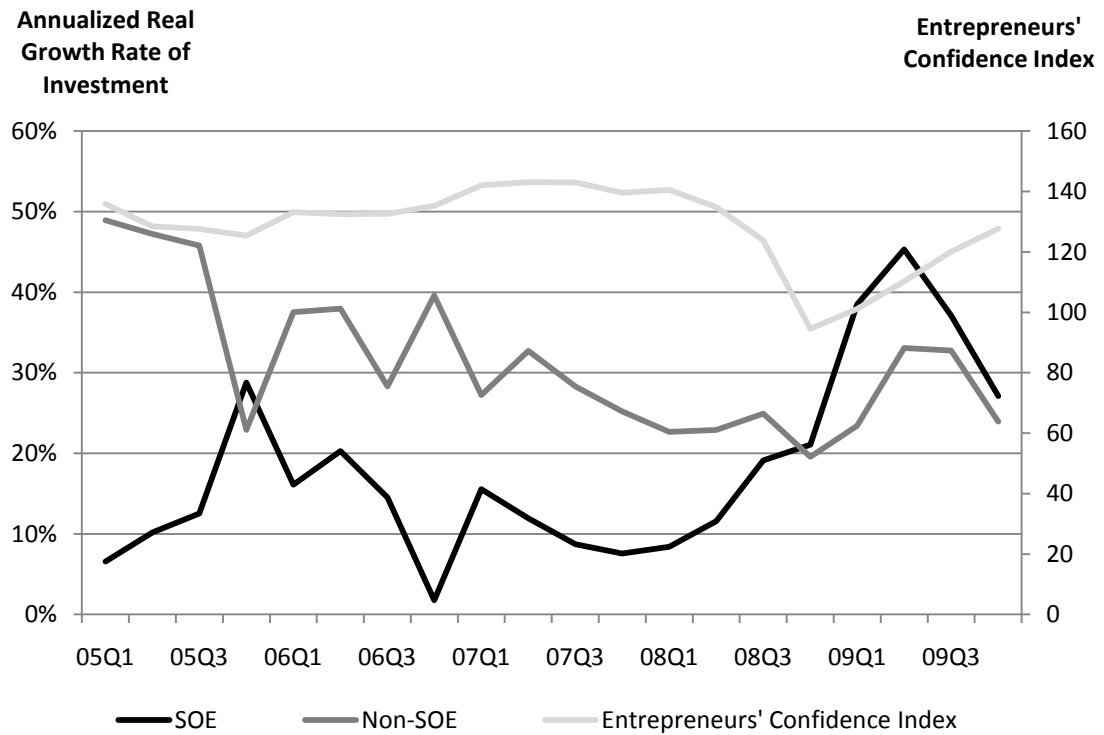
Source: People's Bank of China (the central bank in China).

**Figure 5: Quarterly Performance of SOEs**



Source: Ministry of Finance, China.

**Figure 6: Annualized Real Growth Rate of Fixed Asset Investment  
and Entrepreneurs' Confidence**

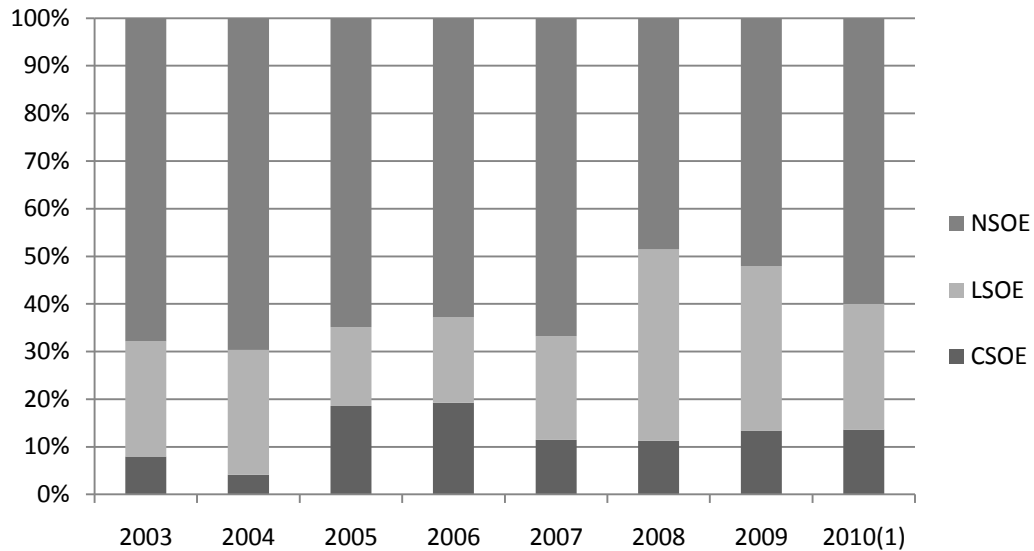


Source: National Bureau of Statistics, China.

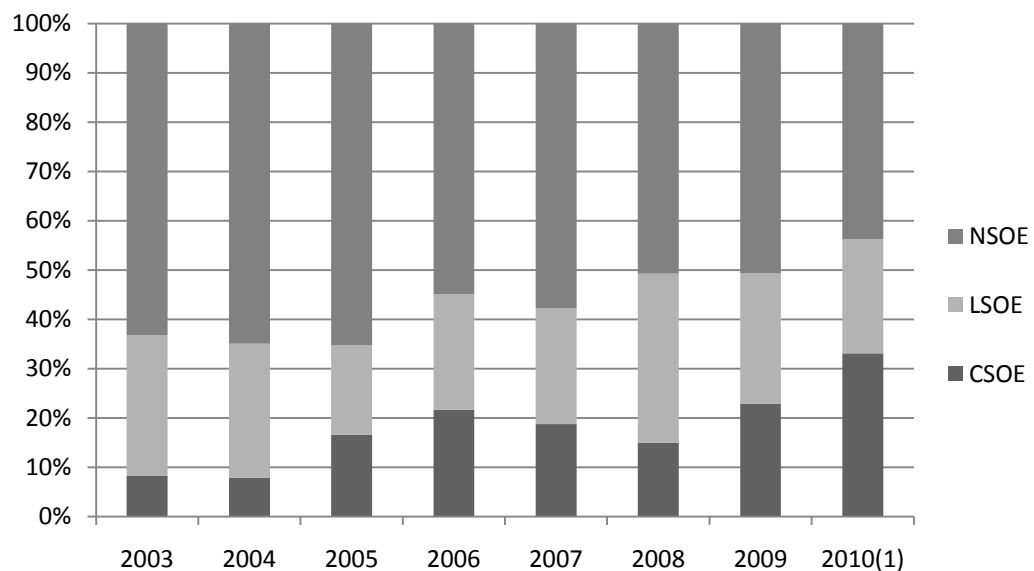
**Figure 7: Market Share of the Three Categories of Buyers**

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).

**(A) Market Share by Total Floor Area**



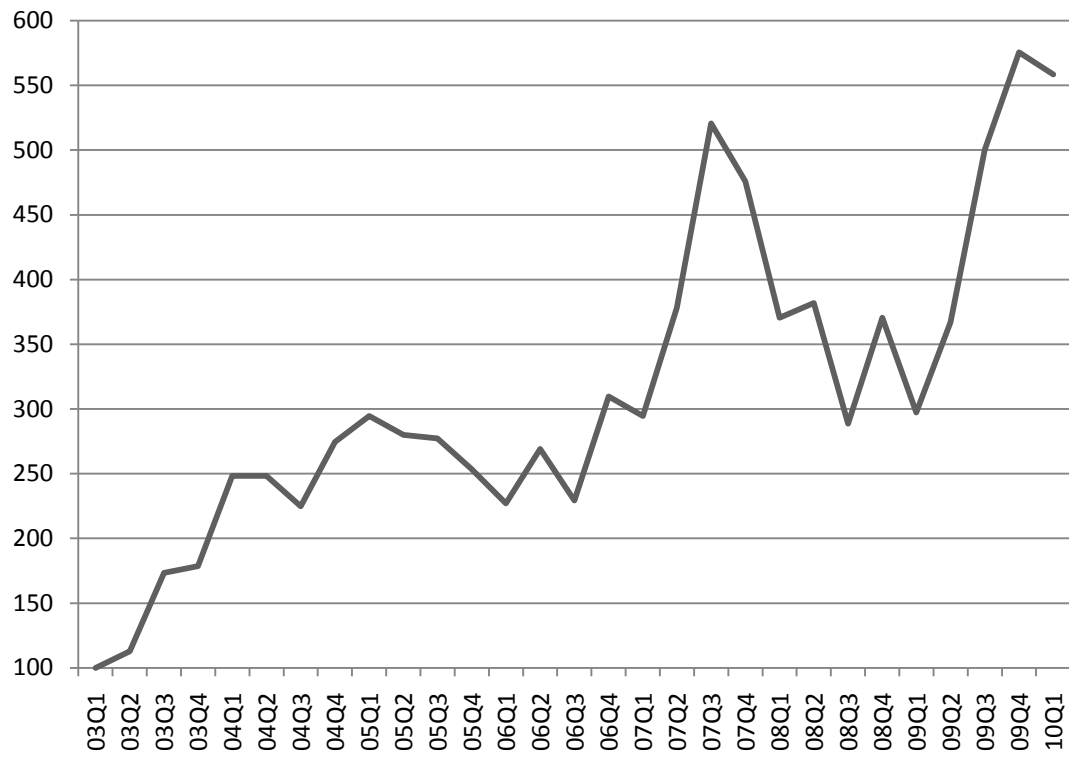
**(B) Market Share by Total Value**



Source: Authors' calculation.

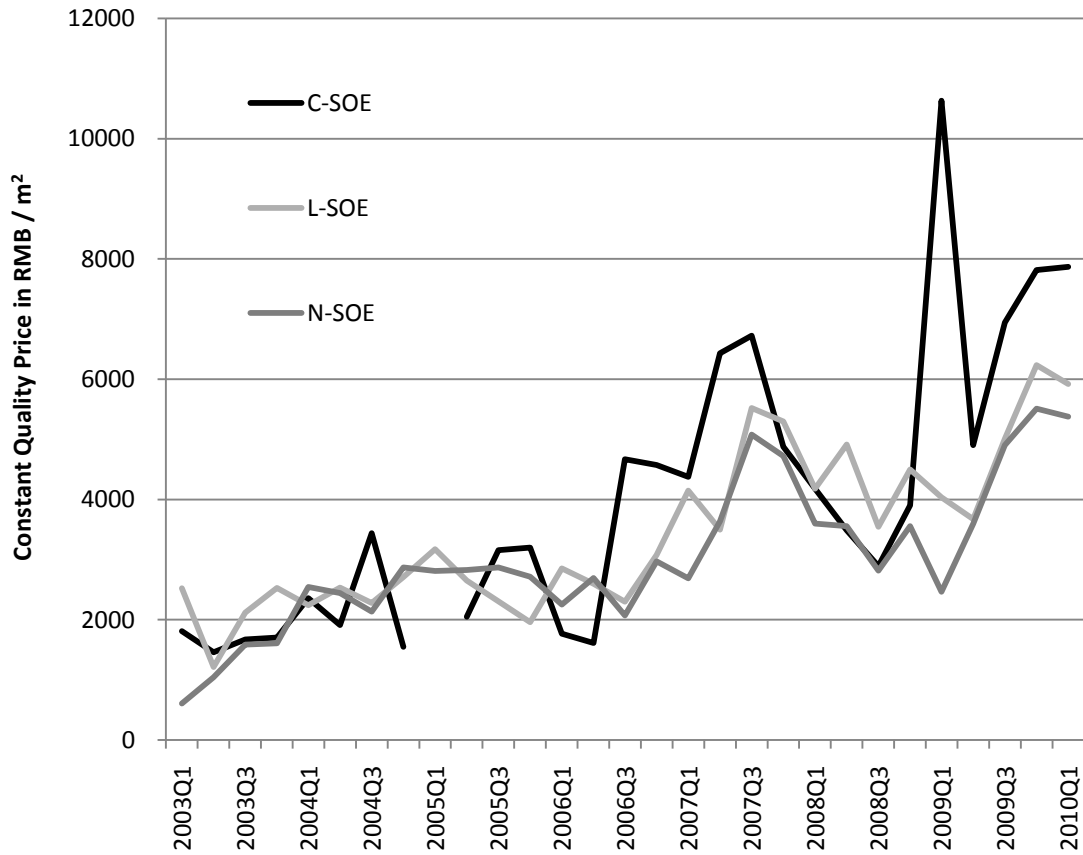
**Figure 8: Constant Quality Index of Residential Land Price Index**

2003 Q1=100

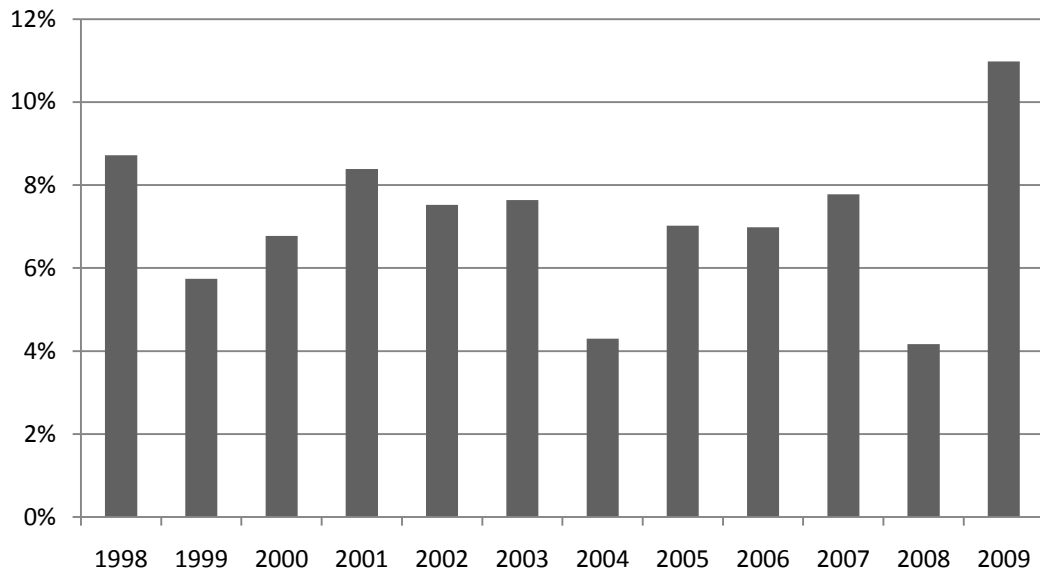


**Figure 9: Constant Quality Residential Land Prices Paid, by Buyer Type**

A model similar with that in Table 8 is estimated. Dependant 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 8. A bundle of typical land parcel attributes are then adopted to predict the constant quality land price for each buyer type.



**Figure 10: Contribution of Real Estate Related Sectors to GDP Growth**



Source: Authors' calculation based on statistics reported by National Bureau of Statistics.

**Table 1: Thousands of Enterprises, by Control Category**

	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	1324	1982	3596
Other Types	37	62	124
Foreign-Funded Enterprise	139	152	186
<b>Total</b>	<b>3027</b>	<b>3250</b>	<b>4960</b>

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 majority shareholder (with more than 50% of share); "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.

**Table 2: Asset Shares of Various Enterprises in 2008**

	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%
<b>Total</b>	<b>208.0</b>	<b>100.00%</b>

Source: National Bureau of Statistics, China.



**Table 3: Banking Financial Institutions at the End of 2009**

	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	5241	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%
Non-Bank Institutions	182	3.23%	1.55	1.92%
<b>Total</b>	<b>5634</b>	<b>100.00%</b>	<b>80.53</b>	<b>100.00%</b>

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

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

**Table 4: Geographic Distribution of Land Transactions**

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	4200
Chengdu	710	113.58	126.22	1111
Hangzhou	704	60.89	214.86	3529
Shanghai	401	48.22	167.99	3484
Shenzhen	115	13.89	35.02	2521
Tianjin	449	105.60	128.00	1212
Wuhan	637	84.51	103.81	1228
Xian	217	32.89	23.86	725
<b>Total</b>	<b>3542</b>	<b>503.88</b>	<b>985.87</b>	<b>1957</b>

**Table 5: Definition and Descriptive Statistics of Variables**

Variable	Definition	Mean	Std. Dev.
<i>LP</i>	Land parcel transaction price (constant 2003 RMB per square meter of floor area of housing permitted to build on the parcel).	2145.21	2838.51
<i>D_CENTER</i>	Distance to the city center; in kilometers.	25.61	23.17
<i>DENSITY</i>	Ratio of floor area to land area.	2.54	1.53
<i>RATIO_PH</i>	Share of public housing required in the total floor area of the parcel.	0.0026	0.051
<i>LANDLEVEL</i>	The parcel is leveled when delivered to the buyer or not; 1=yes, 0=no/w.	0.57	0.50
<i>SIZE</i>	Floor area permitted to build on the parcel; in million square meters.	0.14	0.25
<i>PUBLIC</i>	Part of the parcel is designated for public use or not; 1=yes, 0=no/w.	0.045	0.21
<i>AUCTION</i>	The parcel is transacted by one-stage auction or not; 1=yes, 0=no/w.	0.24	0.43
<i>BIDDING</i>	The parcel is transacted by bidding or not; 1=yes, 0=no/w.	0.097	0.30
<i>CSOE</i>	The parcel is purchased by a C-SOE developer or not; 1=yes, 0=no/w.	0.080	0.27
<i>LSOE</i>	The parcel is purchased by an L-SOE developer or not; 1=yes, 0=no/w.	0.20	0.40
<i>LISTED</i>	The parcel is purchased by a listed company or not; 1=yes, 0=no/w.	0.24	0.43

**Table 6: C-SOE Developers' Share in Land Market (by Total Value)**

City	2003-2008	2009-2010(1)
Beijing	24.33%	53.53%
Chengdu	16.01%	26.31%
Hangzhou	8.24%	6.68%
Shanghai	19.85%	29.97%
Shenzhen	31.55%	6.76%
Tianjin	9.63%	17.19%
Wuhan	19.24%	23.37%
Xian	8.91%	12.98%

**Table 7: 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 4. Dependant variable is the natural log of land price per square meter of permitted housing floor area. Right-hand-side variables as defined in Table 5. Numbers in parentheses are t-ratios (column 1), or robust t-ratios adjusted for city-level clustering (column 2), or t-ratios allowing for random effects (column 3).

	(1)		(2)		(3)	
	OLS		Clustered by City		Random Effects	
<i>log(D_CENTER)</i>	-0.77	(-51.05)***	-0.77	(-24.70)***	-0.77	(-51.27)***
<i>DENSITY</i>	-0.12	(-12.55)***	-0.12	(-4.85)***	-0.12	(-12.66)***
<i>SHARE_PH</i>	-0.11	(-0.44)	-0.11	(-0.82)	-0.10	(-0.43)
<i>LANDLEVEL</i>	0.072	(1.18)	0.072	(0.63)	0.074	(1.24)
<i>SIZE</i>	-0.11	(-2.24)**	-0.11	(-2.15)**	-0.11	(-2.27)**
<i>PUBLIC</i>	0.17	(2.51)**	0.17	(2.80)***	0.17	(2.58)**
<i>AUCTION</i>	0.29	(6.39)***	0.29	(4.50)***	0.29	(6.38)***
<i>BIDDING</i>	-0.088	(-1.69)*	-0.088	(-0.88)	-0.087	(-1.68)*
City Dummies	YES		YES		NO	
Time Dummies	YES		YES		YES	
Adjusted R2	0.99		0.99		-	

Notes: (1) Coefficients of city and time fixed effects are not show. .

(2) Number of observations is 3478.

(3) \*\*\*: significant at the 1% level; \*\*: significant at the 5% level; \*: significant at the 10% level.

**Table 8: 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 4. Dependant variable is the natural log of land price per square meter of permitted housing floor area. Right-hand-side variables as defined in Table 5. Numbers in parentheses are t-ratios (column 1), or robust t-ratios adjusted for city-level clustering (column 2), or t-ratios allowing for random effects (column 3).

	(1)		(2)		(3)	
	OLS		Clustered by City		Random Effects	
<i>C</i> SOE	0.16	(3.16)***	0.16	(2.79)***	0.16	(3.18)***
<i>L</i> SOE	0.11	(3.56)***	0.11	(2.96)***	0.11	(3.59)***
log( <i>D</i> _CENTER)	-0.71	(-46.82)***	-0.71	(-22.53)***	-0.71	(-47.05)***
<i>D</i> ENSITY	-0.10	(-10.95)***	-0.10	(-4.33)***	-0.10	(-11.06)***
<i>S</i> HARE_PH	-0.22	(-0.97)	-0.22	(-2.00)**	-0.22	(-0.96)
<i>L</i> ANDLEVEL	0.070	(1.19)	0.070	(0.68)	0.073	(1.25)
<i>S</i> IZE	-0.21	(-4.18)***	-0.21	(-3.52)***	-0.21	(-4.23)***
<i>P</i> UBLIC	0.11	(1.74)*	0.11	(1.82)*	0.12	(1.81)*
<i>A</i> UCTION	0.28	(6.29)***	0.28	(4.68)***	0.27	(6.29)***
<i>B</i> IDDING	-0.17	(-3.31)***	-0.17	(-1.81)*	-0.17	(-3.32)***
<i>L</i> ISTED	0.14	(4.33)***	0.14	(2.82)***	0.14	(4.37)***
City Dummies	YES		YES		NO	
Time Dummies	YES		YES		YES	
Developer Grade Dummies	YES		YES		YES	
Adjusted R2	0.99		0.99		-	

Notes: (1) Coefficients of city and time fixed effects are not show.

(2) Number of observations is 3478.

(3) \*\*\*: significant at the 1% level; \*\*: significant at the 5% level; \*: significant at the 10% level.

**Table 9. Timing of C-SOE Developer Price Effect**

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 4. Dependant variable is the natural log of land price per square meter of permitted housing floor area. *STIMULUS* is an indicator variable set to zero before the first quarter of 2009 and to one in that quarter and thereafter. Other right-hand-side variables as defined in Table 5. Numbers in parentheses are robust t-ratios adjusted for city-level clustering.

	(1)		(2)		(2)	
<i>CSOE</i>	0.0908	(1.34)	0.0506	(0.83)	0.157	(2.79)***
<i>CSOE</i> interacted with:						
<i>STIMULUS</i>	0.196	(2.46)**	0.190	(2.50)**		
<i>LSOE</i>	0.117	(2.19)**			0.122	(2.33)**
<i>LSOE</i> interacted with:						
<i>STIMULUS</i>	-0.00880	(-0.14)			-0.0290	(-0.49)
$\log(D\_CENTER)$	-0.707	(-22.6)***	-0.709	(-22.7)***	-0.708	(-22.5)***
<i>DENSITY</i>	-0.104	(-4.35)***	-0.105	(-4.37)***	-0.104	(-4.33)***
<i>SHARE_PH</i>	-0.269	(-2.40)**	-0.266	(-2.51)**	-0.226	(-1.99)*
<i>LANDLEVEL</i>	0.0698	(0.68)	0.0703	(0.68)	0.0692	(0.68)
<i>SIZE</i>	-0.211	(-3.57)***	-0.197	(-3.24)***	-0.209	(-3.50)***
<i>PUBLIC</i>	0.120	(1.92)*	0.128	(2.06)**	0.116	(1.85)*
<i>AUCTION</i>	0.274	(4.69)***	0.273	(4.63)***	0.275	(4.69)***
<i>BIDDING</i>	-0.167	(-1.78)*	-0.159	(-1.70)*	-0.170	(-1.81)*
<i>LISTED</i>	0.141	(2.80)***	0.154	(3.13)***	0.142	(2.83)***
City Dummies	YES		YES		YES	
Time Dummies	YES		YES		YES	
Developer Grade Dummies	YES		YES		YES	
Adjusted R2	0.99		0.99		0.99	

Notes: (1) Coefficients of city and time fixed effects are not show. .

(2) Number of observations is 3478.

(3) \*\*\*: significant at the 1% level; \*\*: significant at the 5% level; \*: significant at the 10% level.

**Table 10. Importance of Connections Proxies to C-SOE Price Premium**

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 4. Dependant variable is the natural log of land price per square meter of permitted housing floor area. *STIMULUS* is an indicator variable set to zero before the first quarter of 2009 and to one in that quarter and thereafter. 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. Other right-hand-side variables as defined in Table 5. Numbers in parentheses are robust t-ratios adjusted for city-level clustering.

	(1)	(2)	(3)	(4)
<i>C</i> SOE	0.0358 (0.52)	0.381 (4.12)***	0.0349 (0.52)	0.380 (4.13)***
<i>C</i> SOE interacted with:				
<i>LOCAL</i>	0.314 (3.38)***		0.314 (3.36)***	
$\log(DISTANCE)$		-0.0491 (-3.90)***		-0.0490 (-3.87)***
<i>STIMULUS</i>	0.182 (2.38)**	0.162 (2.13)**	0.185 (2.55)**	0.165 (2.26)**
<i>L</i> SOE	0.121 (2.31)**	0.122 (2.32)**	0.117 (3.15)***	0.117 (3.16)***
<i>L</i> SOE interacted with:				
<i>STIMULUS</i>	-0.0126 (-0.21)	-0.0130 (-0.22)		
$\log(D\_CENTER)$	-0.706 (-22.6)***	-0.706 (-22.6)***	-0.707 (-22.6)***	-0.706 (-22.7)***
<i>DENSITY</i>	-0.105 (-4.38)***	-0.105 (-4.40)***	-0.105 (-4.37)***	-0.105 (-4.40)***
<i>SHARE_PH</i>	-0.341 (-3.22)***	-0.344 (-3.25)***	-0.340 (-3.23)***	-0.343 (-3.26)***
<i>LANDLEVEL</i>	0.0678 (0.66)	0.0672 (0.66)	0.0681 (0.67)	0.0675 (0.66)
<i>SIZE</i>	-0.208 (-3.56)***	-0.207 (-3.52)***	-0.209 (-3.59)***	-0.207 (-3.55)***
<i>PUBLIC</i>	0.115 (1.94)*	0.115 (1.93)*	0.114 (1.93)*	0.115 (1.92)*
<i>AUCTION</i>	0.272 (4.66)***	0.272 (4.65)***	0.272 (4.67)***	0.272 (4.66)***
<i>BIDDING</i>	-0.171 (-1.85)*	-0.171 (-1.85)*	-0.170 (-1.87)*	-0.170 (-1.86)*
<i>LISTED</i>	0.146 (2.90)***	0.146 (2.91)***	0.146 (2.90)***	0.146 (2.91)***
City Dummies	YES	YES	YES	YES
Time Dummies	YES	YES	YES	YES
Developer Grade Dummies	YES	YES	YES	YES
Adjusted R2	0.99	0.99	0.99	0.99

Notes: (1) Coefficients of city and time fixed effects are not show.

(2) Number of observations is 3478.

(3) \*\*\*: significant at the 1% level; \*\*: significant at the 5% level; \*: significant at the 10% level.