Government Credit, a Double-Edged Sword: Evidence from the China Development Bank

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ABSTRACT

Using unique data from the China Development Bank (CDB), this paper examines the effect of government credit on firm activities. I explore the different effects of various types of government credit (infrastructure vs. state-owned enterprises' (SOEs) credit). I also trace the effect of government credit across different levels of the supply chain. I find that CDB infrastructure loans crowd in private firms. CDB industry loans to SOEs crowd out private firms in the same industry but crowd in private firms in downstream industries. I use the exogenous timing of politicians' turnover as an instrument for CDB credit flows to cities.

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Government credit programs are pervasive in many countries around the world and play an important role in capital allocation, especially to infrastructure investment and state-owned enterprises (SOEs). For example, the United States established its earliest federal credit program - the Farm Credit System - in 1916 to provide credit to agricultural and rural America. This was followed by a surge in additional government credit programs after the Great Depression. Some credit programs, such as the Rural Electrification Administration and the Small Business Administration, are still in place.[1] In 2010, the U.S. Government's outstanding commitments for loans and guarantees totaled approximately $2.3 trillion, which was roughly one-third the size of the loans of all the U.S. banks combined (Elliott (2011)). Outside the United States, many countries have development banks that typically issue government credit.[2]

The literature has outlined two opposing views on the effects of government-directed credit. On the one hand, government credit can be justified by the existence of credit market failures. Private banks may not allocate funds to high social return projects with positive externalities if the returns are difficult to be captured (e.g., Stiglitz (1993)). Prime examples are infrastructure investments such as highways or airport constructions. Private firms could benefit from these projects' positive externalities. On the other hand, government credit could crowd out private sector investment, especially when the credit is given at below market rates or to firms that have distorted incentives (e.g., Demirguc-Kunt and Maksimovic (1998), King and Levine (1993a, 1993b), Rajan and Zingales(1998)). A concern is that inefficient established firms are subsidized (e.g., SOEs), while more efficient firms are crowded out (e.g., private firms), which harms the economy in the long run.

Empirical studies have shown mixed results on whether government credit[3] crowds out private sector investment and growth or whether it encourages private sector (crowd in) investment and growth (e.g., Blanchard and Perotti (2002), Cohen et al. (2011), Gale (1991)).

[1] The Rural Electrification Administration (REA) was a former agency of the U.S. Department of Agriculture that administered loan programs for electrification and telephone services in rural areas. The reconstruction Finance Corporation (RFC) provided financial support to state and local governments. It was the predecessor of the Small Business Administration.

[2] For example, there are the KfW Bankengruppe in Germany, the Korea Development Bank, the African Development Bank, the Asian Development Bank, the European Bank for Reconstruction and Development, and the Inter-American Development Bank Group. In the U.S., the National Infrastructure Reinvestment Bank was proposed in 2007.

[3] Government credit can also be viewed as government spending (Lucas (2012b)). CDB loans are subsidized. In China, CDB lending can be viewed as an extension of government fiscal policy.

Due to limited data, these studies usually explore only the effects of *aggregate* government credit. In this paper, I am able to add to the prior literature by analyzing the role of *different types* of government credit (infrastructure loans vs. industry loans to SOEs) in the context of China. In addition, I trace the effect of credit across SOEs and private firms, as well as across *different levels* of the supply chain. I find that government loans to SOEs *crowd out* private firms in the same industry, but interestingly they *crowd in* private firms in *downstream* industries. Moreover, infrastructure loans appear to have positive effects on private firms. These opposing effects may shed light on the mixed results of previous studies.

I study this issue based on a unique industry-level loan data set from the China Development Bank (CDB) for the period 1998 to 2013.[4] I combine it with a firm-level panel data set from the Chinese Industry Census, which contains all manufacturing firms with annual sales of more than 5 million RMB (US$700K) from 1998 to 2009. The China Development Bank is one of three policy banks with a mandate to provide credit support to infrastructure projects and SOEs in basic industries, primarily by lending to local governments.[5] The CDB loan data contain city-level, aggregate, outstanding loan amounts and issuances. Loans are categorized into infrastructure loans and industry loans to SOEs. The data set also contains province-level, aggregate, outstanding loan amounts and issuances, which are categorized into 95 industries.[6]

I first use a simple OLS regression framework. I find that CDB industry loans are associated with larger investment in assets, greater employment, and more debts of SOEs that receive these CDB loans. On the other hand, the amount of CDB industry loans to SOEs is negatively correlated with investment, employment, total sales ,and sales per worker of *private firms* in the same industry.[7] In contrast to industry SOE loans, the CDB city infrastructure loan amount is positively correlated with private firms' assets, debt, total sales, and sales per worker. Doubling the CDB industry loans is associated with a 0.6% increase in

[4]The data is directly from the China Development Bank. This internal data is compiled in the CDB headquarters from the detailed monthly loan reports of each CDB branch.

[5]The CDB usually coordinates with local governments and lends to infrastructure projects and SOEs in the province or city. Most of the CDB loans are lent via local governments, which are implicitly or explicitly responsible for these loans. See more details in Section II.

[6] These industries include both infrastructure sectors (e.g., road transportation, water supply, public facilities) and industry sectors (e.g., agriculture, tobacco, software, oil refining, textile). See more details in Section III.

[7]The majority of the CDB industry credit goes to SOEs. These loans are subsidized. On average, the interest rates of the CDB loans are 100bps below the interest rates from commercial loans.

SOEs' assets and a 0.3% decrease in private firms' assets.

While the effects are significant, there is a potential endogeneity concern. Government credit might flow into areas or industries with especially high or low growth potential. Moreover, in China, it is the local governments that borrow from the CDB for infrastructure projects and SOEs. The local governments, which enjoy closer relationships with the CDB, may be granted more loans. To address these concerns, I use the exogenous timing of political turnovers to identify the causal effects of government-directed credit.[8]

In particular, I use the *timing* of municipal government turnovers as an instrument for CDB loans. In China, the city secretary (equivalent to a mayor in the U.S.) is replaced every five years, on average. This turnover is decided not by an election but by a higher-level Communist Party official. About half of the cities have the same five-year turnover cycle as the National Congress of the Communist Party. But some cities have different turnover cycles if they were newly founded during the 1990s and started on different cycles due to the year in which they were founded[9]. The city secretary plays a key role in CDB loan allocations. Infrastructure loans are usually lent to municipal governments directly. Industry firm loans are often lent to SOEs, and municipal governments are deeply involved in, and are responsible for, arranging these loans.

To verify the instrument, I begin by testing the exogeneity of city secretaries' turnover timings. I find that turnover timing does not correlate with past economic performance. I conduct first-stage regressions by regressing cities' borrowing from the CDB on the number of years the city secretary has been in the city. I control for city fixed and politician fixed effects to mitigate concerns that the CDB might lend more to cities or politicians that have better political connections. I find most cities borrow significantly more during the first year of the secretaries' terms, and monotonically decrease borrowing during later years. The borrowing of the city goes up again when a new secretary comes in. On average, secretaries reduce total loan amounts by 36.4% each year during their tenure in office. I find similar borrowing patterns in both infrastructure and industry loans. Moreover, I also control for

[8]Previous studies use the exogeneity of political variables (e.g., political cycle, political competitiveness, and politicians' seniority) to overcome the endogeneity of the government credit or spending (e.g., Bertrand, Kramarz, Schoar, and Thesmar (2007); Carvalho (2013); Cohen et al. (2011); Dinc (2005)); Sapienza (2004)).

[9] More than 100 new cities were converted from villages during the 1990s. For example, Fuyang, a city in northwestern Anhui province in China, was founded in 1996. Its turnover cycle started from 1996, and the next secretary began in 2000. This is dissimilar from the national cycle.

year-fixed effects to take out the macro time trend of the national turnover cycle. When I select the "off-national cycle" cities[10], I find that these borrowing patterns still exist. This further shows that the part of the variation from turnover timing is due to the different cycles among different cities, rather than the national turnover cycle only. I also find the secretaries' chances of promotion are associated with more borrowing from the CDB in their early terms. This is in line with the hypothesis that the political ambitions of the secretaries drive these borrowing patterns.

In the second-stage regressions, I regress firm-level dependent variables on the estimated CDB city-level loan amounts. Consistent with the OLS results, I find that increasing CDB industry SOE loans led to *decreases* in private firms' assets, sales, and sales per worker. On the other hand, increasing CDB city infrastructure loans led to *increases* in private firms' assets, employment, debt, and total sales. These results are robust when I control the industry time trends. On the external margin, when CDB loans increase, the city has fewer private firms but more SOEs.

The CDB loans' *opposing* effects on private firms and SOEs also alleviate the concern that changing investment opportunities in a city may be associated with the timing of city secretary turnovers. I further document that other channels through which the city secretary may influence a city's business are not correlated with the turnover cycles (e.g., enforcing tax treaties better, raising money by requesting more transfers, and selling more land). Moreover, I find that for cities with no CDB loans, turnover timing has no effect on firms. These findings support my hypothesis that turnover timing provides exogenous variation of borrowing timing. The findings also help reduce the concern that alternative channels may play a major role.

To explore the *heterogeneous* effects of government credit on private firms at *different levels* of the supply chain, I analyze province-level loan data in 41 manufacturing industries. I again use city-level turnover timing as an exogenous shock and match it at the province level. I identify the number of years the city secretary has been in the city and match this data to the city's biggest SOE industry at province level. If the city secretary is in a early term (within three years of entering the office), I consider it a shock to CDB province-level loans to the industry (i.e., the largest SOE industry of the city). In the first-stage regression, I find that province-level CDB loans in an industry are 33.2% higher if the corresponding

[10]I exclude cities whose turnover is at the same time as the national turnover cycle(year 1998, 2003, and 2008). The remaining "off national cycle" cities have different turnover cycles than the national cycle.

city secretary is serving in the first three years of a term. In the second-stage regressions, I find that increases in CDB loans led to decreases in assets, employment, debts, and sales of *private* firms within the same industry and same province. SOEs in the same industry and province experience increases in assets, employment, debts, and sales. Therefore, CDB industry loans *crowd out* private firms in the same industry and *crowd in* SOEs.

Finally, I study CDB industry loan effects on *upstream* and *downstream* industries, and use the input-output matrix to identify inter-industry relationships. For each industry, I pick its largest intermediate input from other industries as an upstream industry. I find that increasing CDB loans to the upstream industry led to increases in downstream private firms' assets, debts, and sales. Evidence also suggests that private firms with better political connections benefit significantly more from these CDB upstream industry loans. In sum, although CDB industry loans crowd out private firms within the same industry, they crowd in private firms in downstream industries.

To calculate the overall effects of CDB loans on individual firms, I multiply the growth of different types of CDB loans (e.g., infrastructure loans, industry loans, and upstream loans) by the estimated coefficients. The total effect of CDB loans (including both infrastructure and industry credit) on annual asset growth of private firms is 3.4%, on average. Private firm's annual average asset growth was 15.4% from 1998 to 2009. Therefore, credit from the CDB contributes 22% of growth in the private sector. Moreover, total CDB credit increases private firms' sales per worker by 10.8% annually. However, CDB industry credit to SOEs has negative overall impacts on private firms. On average, a $1 million increase in the CDB's outstanding industry loan amount led to a $0.52 million decrease in private firms' total assets.

The remainder of the paper is organized as follows: Section I is the literature review. Section II provides the history of the CDB and local government debt in China. Section III describes the data. Section IV gives the empirical analysis and presents the results. Section V concludes.

I Literature review

This paper relates to literature that examines whether government credit and spending crowds the private sector in or out. On the one hand, Atkinson and Stiglitz (1980) suggest the "social view" that SOEs can be justified under market failures (e.g., Stiglitz and Weiss

(1981); Greenwald and Stiglitz (1986)). Stiglitz (1993) argues that government directed credit can fund projects with high social returns where private banks might not allocate the funds. On the other hand, government credit could crowd out private sector investment, especially when the credit is given at below market rates or to firms that have distorted incentives. King and Levine (1993a, 1993b) explore the relationship between financial development and growth. They find that credit to SOEs is associated with lower growth of GDP, capital stock, investment, and lower efficiency. Rajan and Zingales(1998) find the fraction of domestic credit going to the private sector is strongly correlated with market capitalization to GDP. One explanation is that government involvement in industry crowds out the private sector. Bertrand, Schoar, and Thesmar (2007) suggest government intervention in banking may create implicit barriers to entry and exit in product markets by subsidizing poorly performing established firms. Many studies shows mixed evidence on whether government credit crowds out or crowds in the private sector. Gale (1991) numerically estimates the effects of federal lending, suggesting credit subsidies are costly and raise private investment slightly. A survey from Schwarz (1992) show limited evidence regarding the impact of U.S. credit programs on growth. Craig et al. (2007) find a small correlation between SBA loan guarantees and local economic growth. Shaffer and Collender (2009) find that total aggregate federal funding is associated with significantly faster employment growth, but also with volatile incomes.

In this paper, government credit from the China Development Bank can be treated as fiscal spending. Lucas (2012b) views federal credit programs as fiscal policy since credit subsidies are costly and affect pricing and allocation in credit markets. For government spending, there has been a long debate between Keynesian and neoclassical[11] theories. Vector auto regression on macro data is the standard method of studying the effects of government spending shocks (e.g., Blanchard and Perotti (2002), Caldara and Kamps (2008), Fatas and Mihov (2001), Gali et al. (2007), Rotemberg and Woodford (1992), Ramey (2008)). The literature also explores exogenous shocks to government spending. Ramey and Shapiro (1998) use U.S. military buildups as exogenous shocks, finding that product and consumption wages fall after a military buildup. Burnside et al. (2004) use exogenous changes in military purchases as a fiscal shock, suggesting real wages decline and tax rates increase after the shock, and investments rise in the short term. This paper is closely related to a study by Cohen

[11] Aschauer and Greenwood (1985), Barro (1981, 1989), Baxter and King (1993), Finn (1995), Hall (1980), and Mankiw (1987) use dynamic general equilibrium mode to study the effects of government spending.

et al. (2011), who use changes in congressional committee chairmanships as an exogenous shock to federal expenditure in states, finding that increasing fiscal spending makes firms reduce investments in new capital and R&D and increase pay outs to shareholders. They aggregate government spending at the state level. However, we still know little about the effects of government credit or spending. One problem is that there is no detailed analysis on the impact of government credit in individual industries. This paper is based on far more detailed industry categories, which include 95 industries in China (e.g., farming, livestock, food, beverages, tobacco, non-ferrous metals mining and processing, and software). I am able to separate the crowding out and crowding in effects of government credit by looking at different levels of the supply chain.

This paper also relates to literature that studies political influences on government spending or credit. The political view assumes politicians have political and personal goals that conflict with social welfare maximization (Kornai (1979), Shleifer and Vishny (1994)). Political business-cycle literature started with Nordhaus (1975) and McRae (1977), and was followed by Alesina and Sachs (1988) to model how the government uses economic policies to influence elections under democratic political systems. Many recent empirical studies support this view. Sapienza (2004) finds that Italian state-owned banks charge low interest rates in a province in which the associated party is stronger. Dinc (2005) uses cross-country data to demonstrate that government-owned banks, in contrast to private banks, increase lending during election years. Dinc and Gupta (2011) show that in India, the government delays privatization of SOEs in regions with more political competition. Carvalho (2013) uses Brazilian data and finds that politicians influence elections with bank lending. Bertrand, Kramarz, Schoar, and Thesmar (2007) show that politically connected CEOs in France create more jobs in politically contested areas, especially during election years. Khwaja and Mian (2005) find that government banks in Pakistan favored politically connected firms by providing greater access to credit. Connected firms received 45% more loans and had 50% higher default rates on these loans. Although private banks show no such political bias, there is little empirical evidence of the political view in countries without elections. In these countries, politicians are usually much more powerful. In China, government credit affects firms through local government debt instead of a firm's direct political connections with the

CDB. Municipal government plays a key role in CDB loan allocations.

II Background: the China Development Bank and Local Government Financing in China

A. History of the China Development Bank

The China Development Bank was founded in 1994 from six SPC Investment Corporations [12]. The CDB, along with the Export-Import Bank of China and the Agricultural Development Bank, were assigned as three policy banks during financial system reform in 1994. CDB investment covers basic industries and the infrastructure sector. In 2008, the CDB became a corporation with the Ministry of Finance (MOF) and the China Investment Corporation[13] as its two shareholders. Although the CDB is now a corporation, it can still be viewed as an extension of the government's fiscal function.

The CDB's funding is largely from bond issuances. When it was established in 1994, the CDB had $6.3 billion capital. The CDB is entitled to receive disbursements from stage budgets, repayments of principal and interest, and fiscal subsidies arranged from the state budget to national projects. In addition, the CDB was entitled to issue financial debentures to state-owned financial institutions. Commercial banks in China are the largest buyers of CDB bonds. The total volume of financial debentures issued by the CDB is decided jointly by the People's Bank of China (PBOC)[14] and SPC based on yearly credit and fixed-asset investment plans. Interest rates of financial debentures are decided by the PBOC in consultation with the SPC and MOF. The CDB had explicit guarantees from the central government until 2008[15]. The guarantees give the CDB the advantage of financing the bond market cheaply, and its bond interest rate is slightly higher than treasuries in China. By the end of 2013, the

[12]The State Planning Commission (SPC) is a macroeconomic management agency under the Chinese State Council that has broad administrative and planning control over the Chinese economy. These six Investment Corporations were policy institutions established in the late 1980s. They are affiliated directly with the State Planning Commission and function as long-term investment instruments on behalf of the government.

[13]The China Investment Corporation is a sovereign wealth fund responsible for managing part of the People's Republic of China's foreign exchange reserves.

[14] The People's Bank of China is the central bank of the People's Republic of China, with the power to control monetary policy and regulate financial institutions in mainland China.

[15] The guarantees became implicit in 2008 when the CDB changed its corporate governance from SOE to a corporation. However, the interest rate and the issuance volume is unaffected by this change. The CDB is still considered an extension of the government's fiscal function.

CDB had approximately $1.3 trillion outstanding loans, and most are financed through bond issuance. As shown in Figure 1, CDB loans started to increase in 2003, and grew over time, especially from 2008 through 2010. At the end of 2013, the CDB had 5.8 trillion RMB ($0.95 trillion) outstanding domestic loans and 1 trillion RMB ($0.16 trillion) overseas loans.

The bank's lending rates were regulated by the Central Bank before 2008. Between 2008 and 2013, the lending rate was required to sit within a range of a referred rate set by the Central Bank. This range was expanded over the years until mid-2013. After July 20, 2013, the lending rate was liberalized. However, the government still controls the deposit rate. The CDB has been regulated like other state-owned commercial banks, but in practice, the CDB's long-term loan rates have been lower than those of state-owned commercial banks, and much lower than private or shareholding commercial banks, because 1) the CDB is less profit driven, and 2) the CDB's administrative costs are lower than commercial banks[16]. The CDB's loans can be viewed as subsidized loans or government spending.

The CDB is fully state-owned, just like other state-owned commercial banks such as the ICBC, CCB, BOC, and ABC[17], but the CDB's behavior is different. The CDB's business usually covers infrastructure sectors and uncontested markets in which other state-owned commercial banks have little interest. This phenomenon might be due to three reasons. First, the CDB's policy mandate pinpoints the bank in such policy-related areas. Second, the CDB finances its loans by issuing long-term bonds with sovereign ratings, whereas other state-owned commercial banks rely primarily on short-term deposits. Therefore, the CDB conducts long-term lending that not only caters to infrastructure-sector requirements, but also matches its assets and liabilities durations. Third, the CDB's managers and elites used to work in central government agencies, such as the NDRC[18] or SPC, MOF, PBOC, etc., whereas those of commercial banks are lifelong bankers. Such career background disparities might lead to differences in respective visions, political awareness, and behavioral preferences,

[16] Unlike commercial banks, which usually have branches in all cities and villages in China, the CDB has branches only at the province level. One reason is that the CDB does not need local branches to attract depositors. Most of the CDB's money is from bond issuances. The CDB usually focuses only on projects at city or province level, and it does not often invest at village level or below.

[17] ICBC stands for Industrial and Commercial Bank of China; CCB for China Construction Bank; BOC for Bank of China; ABC for Agricultural Bank of China.

[18] The National Development and Reform Commission (NDRC) of the Government of the People's Republic of China, formerly the State Planning Commission and State Development Planning Commission, is a macroeconomic management agency under the Chinese State Council, which has broad administrative and planning control over the Chinese economy.

which affect a bank's business.

Generally, local governments initiate loan applications by submitting project proposals to the CDB, which decides whether to accept or reject them. Allocation of CDB loans depends on many determinants. First, based on the central government's annual credit plan, the CDB gives each province an annual credit quota. For example, if the total credit amount increases by 20%, each province can also increase loans by 15% from the previous year. Second, the CDB keeps part of the quota, and has the flexibility to allocate credit based on other determinants such as supporting national projects, political connections with local governments, how hard local governments lobby, etc. Local governments usually compete for CDB loans, more so in recent years than before. Although there is a general rule on credit allocations, final loan issuances do not necessarily accord with initial plans.

B. Local Government Financing

Since 1989, budgetary law has prohibited local governments in China from incurring debt by . As a result of tax-sharing system reform between local and central governments in 1994, the central government takes the majority (around 70%) of tax revenue. For example, the central government takes 60% of personal and corporate income taxes and 75% of value-added tax. At the same time, local governments bear the responsibility of infrastructure development but do not have the money to do so. With a thorough understanding of local governments' desire to boost local economies and develop local infrastructures, the CDB established direct connections with local governments and helped them create borrowing platforms by creating 100% state-owned companies. Local governments are then able to use these companies to borrow from banks and issue bonds legally. The CDB usually commits a certain amount of loans to fund infrastructure development within a certain period (normally five years). The CDB has several advantages to support local governments. First, it is mandated to invest in infrastructure sectors and pillar industries. Second, different from other banks, the CDB has special long-term funding resources through CDB bond issuances in domestic bond markets.

Before 2008, the CDB was the primary resource for local government financing, especially concerning long-term borrowing. In November 2008, along with a 4 trillion RMB ($586 billion) stimulus plan[19], commercial banks started to lend to local governments aggressively.

[19]The 4 trillion (US$ 586 billion) stimulus plan was announced by the State Council of the People's Republic

These were usually short-term loans (one to three years). In 2010, the central government decided to pull back the stimulus plan. As a result, many commercial banks either stopped lending or rolled loans over to local governments. However, local governments' investments are usually long-term (such as infrastructure investments), and they needed loans to continue projects initiated under the stimulus program. Therefore, after 2010, many local governments started issuing bonds and borrowing from shadow banking systems in China. The CDB is still a long-term, stable finance resource for local governments. This paper focuses on the period from 1998 to 2009, which overlaps with the stimulus plan by only one year. During the sample period, the CDB played a very important role in local government borrowing.

III Data Description

A. Data

This paper uses three data sets: (1) The China Development Bank, (2) The Chinese Industry Census (CIC), and (3) The Zechen and Baidu Encyclopedia Database.

CDB data contain both city- and province-level loan data. At the city level, they record yearly aggregate CDB outstanding loan amounts and loan issuances to both infrastructure projects and industry SOEs from 1998 to 2010, across 310 cities in China[20]. City-level data were collected by a CDB internal survey in 2010, in which branch managers at the province level manually categorized projects into various cities. At the province level, the CDB data set contains monthly aggregate CDB outstanding loan amounts and loan issuances in 95 industries for each of the 31 provinces[21] from 1998 to 2013. The industries include infrastructure sectors (e.g., road, air, rail transportation, water supply, public facilities, etc.) and industry sectors (e.g., agriculture, tobacco, software, oil refining, textile, etc.). In total, there are 27 infrastructure sectors and 68 industry sectors. Table 1, Panel B, lists some large infrastructure sectors such as road construction, railway, water systems, and

of China on November 9, 2008, to minimize the impact of the global financial crisis. The central government also ordered financial institutions (mainly commercial banks) to lend certain amounts within a limited period. Commercial banks started to increase lending dramatically, including lending to local governments.

[20]They do not include Beijing, Shanghai, Tianjing, and Chongqing, which are classified as provinces.

[21]In China, there are 27 provinces plus Beijing, Shanghai, Tianjing, and Chongqing that are under direct control of the central government. Among these 95 industries, the CDB added 11 new industries in 2005 but doesn't have data before 2005.

telecommunications. City-level loan data do not include province-level projects such as highways. The CDB has only provincial branches, and each branch is required to report project information to headquarters at the end of each month. A CDB central server compiles the provincial data and updates them monthly. I use annual data during my analysis. City- and province-level economic variables (e.g., GDP, income per capita, total employment, and fiscal income) are from the China Statistical Yearbook.

The Chinese National Bureau of Statistics (NBS) collected the Chinese Industry Census (CIC) data, including all manufacturing firms in China with annual sales over 5 million RMB (about $700,000) from 1998 to 2009. It has detailed annual accounting data and firm characteristics such as number of workers, industry categories, locations, registration types, political hierarchies, government subsidies, wages, etc. In total, there are 711,892 firms in China. CIC appears to be the most detailed database on Chinese manufacturing firms, and the content and quality of the database are sufficient. Using firm registration type from CIC data, I classify firms as SOE and private firms. Location data in CIC is an 11-digit number that locates the firm at the street level. I cut the first four digits to identify the city. Industry codes are the standard four-digits, and I cut the first 2 to match CDB industry codes. There was a change in industry codes by the Chinese National Bureau of Statistics in 2002, so I adjusted the industry codes to 2002 standards.

Regarding the data set from politician profiles, I manually collected it from the Zechen Database, which records all mayors and secretaries of municipal committees in each city from 1949 through 2013. I collected a list of names of mayors and secretaries, and their terms in office, at the monthly level. I also collected data for members of provincial committees of the Communist Party of China. These data cover all 334 cities and 31 provinces in China. Based on the list of names, I searched politicians' profiles from the Baidu Encyclopedia database, a Chinese-language, collaborative, Web-based encyclopedia provided by the Chinese search engine Baidu. The encyclopedia is the best Chinese online encyclopedia, and generally provides clear profiles of prominent people, better than official public profiles of politicians. However, the quality of politicians' profiles varies among cities, especially small cities. To compensate, I use the Xinhua News[22] as a supplementary source to crosscheck data from

[22]The Xinhua News is the official press agency of the People's Republic of China and the largest center that collects information and material from press conferences in China. It is also the largest news agency in the country.

the Baidu Encyclopedia. Final profile data include 1,227 city secretaries and 97 provincial governors. Each profile featured a politician's gender, age, and birthplace. Some politicians had the same name, which is common in China. To overcome this limitation, I conducted a thorough double check on politicians with the same name, and distinguished them with a separate ID number. When I merged the CDB city-level data with politicians' profiles, there were 310 cities in total (the remaining 24 cities did not have CDB loans).

B. Summary Statistics

Table 1 presents summary statistics, and Table A1 in the Appendix contains a detailed definition and construction of each variable. CDB city-level loan data include 310 cities from 1998 to 2010. The data separate loans into two categories: infrastructure and industry. The top left panel of Figure 1 shows that the total city-level, outstanding loan amount increased from 321 billion RMB ($40 billion) in 1998 to 2,811 billion RMB ($433 billion) in 2010. Total loans for infrastructure increased from 27.4 billion RMB in 1998 to 1,143 billion RMB in 2010. Industry loans increased from 293.6 billion RMB in 1998 to 1,659 billion RMB in 2010. Overall, industry loans were bigger than infrastructure loans at the city level, but infrastructure loans grew faster. The bottom two panels of Figure 1 show the ratio of city-level infrastructure loan and industry loan to total loan amount, respectively. For infrastructure loan, the ratio was almost 0 from 1998 to 2000, which is consistent with the top two panels of Figure 1. Moreover, the gap between the top and bottom quartiles enlarged from 1999 to 2003 and closes a bit after 2003. This means different cities have very different combinations of infrastructure and industry SOE loans. One reason is that city secretaries tend to help the local SOEs to borrow from the CDB. I find industry loan amounts are significantly higher in cities with more SOEs. These cities with big state-owned sectors borrow relatively less in infrastructure. On average, annual loan issuances were about one-third of the outstanding loan amount. One feature of CDB loans is that both cash inflows and outflows are huge because investment projects are huge, and loans are often rolled over.

[Place Table 1 about here]

CDB province-level loan data cover 31 provinces and 95 industries from 1998 to 2013.

The top right panel of Figure 1 shows that total province-level outstanding loan amounts increased from 474 billion RMB ($59 billion) in 1998 to 5,888 billion RMB ($935 billion) in 2013. Total loans for infrastructure increased from 124 billion RMB in 1998 to 3,569 billion RMB in 2013, and total loans for industry increased from 326 billion RMB in 1998 to 2,205 billion RMB in 2013. Overall, industry loans were larger than infrastructure loans in 1998, but infrastructure loans grew much faster and surpassed industry loans. Compared to city-level loans, province-level loans were larger than infrastructure projects. If a loan was for a provincial project such as highway construction, the CDB did not break it down and assign it to various cities. Instead, it recorded it at the province level.

[Place Figure 1 about here]

Chinese Industry Census data contain 711,892 firms in the manufacturing sector. Each has a unique registration number and company name. The registration number is a unique number for a company from SAIC [23]. The registration number of a company that no longer exists is recycled. I use registration numbers as IDs for the companies. Unfortunately, CIC data do not record registration IDs for 2008 and 2009. I used a name-matching algorithm[24] and recovered 90% of registration IDs. CIC also has registration types for the company, which depend on a company's shareholders. I used registration type to categorize companies into two groups: state-owned enterprises(SOEs) and private companies. SOEs are defined as state-owned or collective-owned enterprises. Private firms are defined as private-owned enterprises, private partnership enterprises, private limited liability company, or private limited companies. I exclude from the CIC data set firms that have mixed ownerships (e.g., half privately owned and half state owned). Table 1 shows that the average ROA was 9%, and the average number of employees was 108. The average ROA for SOEs was 5.2% and the employee number was 353. In China, SOEs are less efficient and have more employees. Tax_Corp is the effective annual corporate tax for each firm, missing if a firm's income before tax was negative. Tax_VAT is the effective annual value-added tax rate of each firm. The CIC recorded the value-added tax in only 1998, 1999, 2000, 2003, 2005,

[23] State Administration for Industry and Commerce of the People's Republic of China

[24] I matched the name of each company in 2008 and 2009 with company names from 1998 to 2007 that had registration IDs. I grouped companies by city and industry to increase matching probability and accuracy.

2006, and 2007. The average corporate tax rate was 19.41% and value-added tax rate was 15.09%, which was consistent with real tax rates [25]. In China, the number of private firms increased dramatically between 1998 and 2009. The number of SOEs decreased over time, due primarily to privatization. For aggregate assets, the private sector again increased the most, surpassing SOE sectors. From 1998 to 2009, the private sector contributed greatly to China's double-digit economic growth, and on average, it had smaller firm sizes than SOEs. After matching CDB province industry data with CIC firm data, there were 41 industries in the manufacturing sector.

In China, the political leader in a municipal government is called the Secretary of the Municipal Committee of the Communist Party of China (equivalent to a mayor in the U.S.). For political turnover, the top panel of Figure 2 is a histogram of city secretaries' term lengths from 1997 to 2013, among the 334 cities. The same city secretary can appear in the sample more than once since many of them serve at least two cities. I rounded monthly turnover data into year frequency using June as the cutoff[26]. Forty-three percent of city secretaries left the city in their fifth year. In some cases, city secretaries left before the fifth year, and in fewer cases, they remained. The national political turnover cycle is also five years, and it occurs around the National Congress of the Communist Party of China (CPC). Four national CPC congresses occurred in the data from 1997 to 2013: 1997, 2002, 2007, and 2012. Since the National Congresses of the Communist Party usually occur at the end of these years, the turnover could occur the next year. The bottom panel of Figure 2 is a histogram of turnover years, concentrated in the years 1998, 2003, 2008, and 2013. These years are one year after the National Congress of the Communist Party. However, some special cases appeared such that turnover did not occur every 5 years, and did not occur during a National Congress. The reason is because China experienced fast urbanization, and many cities were incorporated during the 1990s. A city secretary's first tenure is usually five years, but the starting year might not have coincided with the national cycle. In the politicians' profile data, the average age of city secretaries is 50 years; the youngest was 32 and the oldest 62. The legal retirement

[25] The current corporate tax rate is 25%. For small businesses, it is 20%. For high-technology firms or other firms supported by the government, the corporate tax rate is 15%. The value-added tax rate varies between 13% and 17%.

[26] If secretaries left before June and their successors succeeded them before June, I considered the successor the city secretary for the entire year. If the secretaries left after June, I considered them the city secretary for the entire year.

age for males is 60, and 55 for females. "Promotion" is a dummy variable for whether a city secretary was promoted during turnover. 38% of city secretaries were promoted after their terms ended. Promotion is defined as being appointed to a higher political hierarchy in the government[27].

[Place Figure 2 about here]

IV Empirical Analysis and Results

A. Firms' Response to CDB Loans

There has been a long debate on the effects of government credit, especially for the private sector. Public goods such as infrastructure help economic growth since firms benefit from the infrastructures around them. However, government credit also crowds private sectors through the tax channel, interest rate channel, etc. In China, tax and interest rate channels are shut off; the cities and even the provinces cannot change tax rates or categories. Only the central government can determine taxes. Although some tax treaties are flexible and local governments use them differently, the central government sets the rules for tax treaties, and manipulation is limited. Interest rates were not liberalized until July 20, 2013, after which banks determined their own interest rates on loans, but deposit rates were still strictly controlled by the central bank. The primary channel of crowding in China comes from competition between SOEs and the private sector. In the past and currently, Chinese SOEs have been important to many industries, even following the privatization wave from 1998 to 2005. Even today, SOEs control significant shares of assets. The majority of the CDB's industry loans go to SOEs, and only a small share goes to the private sector, and then only to large, powerful private firms. It is rare that the CDB lends money to small private firms run by entrepreneurs.

[27] City secretaries' political hierarchies vary across cities. Secretaries from Beijing, Shanghai, Tianjing, and Chongqing are at ministerial level. Fifteen cities in China are at vice-ministerial level: Dalian, Qingdao, Ningbo, Xiamen, Shenzheng, Haerbing, Changchun, Shenyang, Jinan, Nanjing, Hangzhou, Guangzhou, Wuhan, Chengdu, and Xian. Others are at the departmental level. I do not include ministerial-level cities during city-level analyses since they are at the same level as provinces. I define promotion based on varying political hierarchies accordingly.

I begin the analysis by OLS regressions and explore the correlations between CDB loan amount and a firm's asset investment, employment, borrowing as well as firm's performances such as ROA, total sales, and sales per worker. I use the total outstanding loan amounts instead of new issuances because many new loan issuances are for rolling over old loans. I match province industry outstanding loan amounts with manufacturing firms in the same province and same industry. The regression is:

$$Y_{l,k,p,t} = \alpha + \beta \times LogLoan\_PI_{k,p,t} + Control_{p,t-1} + YearFE + FirmFE + \varepsilon_{l,t}, \quad \text{(IV.1)}$$

where $Y_{l,k,p,t}$ is the dependent variable of firm l in industry k province p in year t such as the logarithm of total assets, number of employees, total debts, ROA, sales per worker, and total sales. I control local economic condition variables, and year-fixed and firm-fixed effects. Panel A of Table 2 shows the regression results for SOEs. CDB industry firm loans had significantly positive correlations with SOEs' total assets, employment and debts. Panel B of Table 2 shows the regression results for private firms. CDB industry firm loans had significantly negative correlations with private firms' total assets, employment, total sales, and sales per worker. These results show that CDB industry loan amounts may have positive impacts on SOEs' asset investment, employment, and borrowing, and have negative impacts on private firms' asset investment, employment and sales. The CDB industry loans may crowd out the private sector and crowd in SOEs within the same industry. Moreover, I also study infrastructure loans. Panel C of Table 2 shows the regression results for city-level infrastructure loans. It shows that private firms' total assets, debt, total sales, and sales per worker are positively correlated with CDB infrastructure loans.

[Place Table 2 about here]

However, there is a potential endogeneity concern that CDB credit allocations are endogenous. The CDB lends to infrastructure projects and SOEs via local governments. Local governments that enjoy better relationships with the CDB may borrow more. Furthermore, the CDB is a policy bank with a mandate to provide credit supports to infrastructure and pillar industries, especially in undeveloped areas in China. In order to fix this problem, I use

municipal government turnover timing as the instrument for CDB loans.

B. Instrument: City Secretary's Turnover Timing

I first test the exogeneity of city secretaries' turnover timing. As mentioned above, city secretaries' terms are five years, and each city has its own turnover cycle. Although the types of turnover, such as promotion, might be endogenous, the timing of turnover is exogenous. I only use the variation from turnover timing. I use the Cox proportional hazard model, which includes politicians' demographics, economic performance, and time of turnover. The hazard rate of turnover is given by:

$$h(t) = h_0(t) \exp(\beta_1 x_1 + \beta_2 x_2 + \cdots + \beta_k x_k), \tag{IV.2}$$

where $x_1 ... x_k$ are politician's ages and gender, economic performance in the city such as GDP, income per capita, city government fiscal income, and city employment. I also include the dummy variable $NationalCycle$ to account for whether it is a National Congress Party year. I have both time-varying and time-invariant variables, and assume the time-varying variables are constant throughout a year. I followed Wooldridge (2002) to construct a hazard model, and report the coefficients and hazard ratios from the estimation in Table 3. I include previous CDB outstanding loans to test whether the timing of turnover is affected by existing CDB loans. In column 1 to 4 of Table 3, $NationalCycle$ had a positive effect on city secretaries' turnover, which is consistent with patterns in Figure 2 since many city turnovers are in national turnover years. Column 5 of Table 3 reports hazard ratios, and on average, the turnover probability increased by 39.3% during national turnover years. Age of a secretary had positive effects on the timing of turnover because when city secretaries get older, they are more likely to retire. The timing of turnover did not depend on a city's past economic performance and CDB loans. I include economic variables and city loans in two-year lags, and find nothing significant. In columns 1 and 3 of Table 3, I exclude *Age* and *Gender* since they have some missing values. Again, timing of turnover did not depend on a city's economic performance and CDB loans.

[Place Table 3 about here]

Then, I explore borrowing patterns over various periods of a city secretary's term. The CDB's primary lending method is to coordinate with local governments and support both infrastructure projects and industry firms, which are usually SOEs. The city secretary is the top-ranking politician in the city, and usually plays a large role during the lending process. The regression is:

$$\begin{aligned} LogLoan_{j,t} &= \alpha + \beta \times PoliticianYear_{i,j,t} + Control_{j,t-1} + YearFE + cityFE \\ &\quad + SecretaryFE + \varepsilon_{j,t}, \end{aligned} \tag{IV.3}$$

where $LogLoan_{j,t}$ is the CDB loan variable in city j in year t. I used the logarithm of the CDB outstanding loan amounts and new issuance for infrastructure, industry, and total loans as dependent variables. $PoliticianYear_{i,j,t}$ is the number of years that secretary i stayed in city j in year t. $Control_{j,t-1}$ are variables for economic conditions such as GDP, urban income per capita, fiscal income, and the working population. I also include city fixed effects, year fixed effects, and secretaries' personal fixed effect since cities have varying situations and secretaries have their own investment styles. Standard errors are clustered at the city level. In Table 4, Panel A, the coefficient of $PoliticianYear$ was -0.364 at 1% significance in column 1; on average, if a city secretary stayed one more year, borrowing from the CDB decreased by 36.4%. If I break loans into infrastructure and industry loans, the effects are stronger for industry loans. In columns 3 and 5 of Table 4 Panel A, the coefficient of $PoliticianYear$ was -0.122 for infrastructure outstanding loans and -0.338 for industry loans. Instead of using $PoliticianYear_{i,j,t}$, I use $Year\_1_{i,j,t}, ..., Year\_6_{i,j,t}$, which are dummy variables for years that a secretary i stayed in city j in year t. $Year\_1_{i,j,t}$ equals 1 if it was the first year secretary i stayed in city j, and zero otherwise. $Year\_2_{i,j,t}$ equals 1 if it was the second year secretary i stayed in city j and zero otherwise. $Year\_3_{i,j,t}$ to $Year\_6_{i,j,t}$ were constructed similarly.

$$\begin{aligned} LogLoan_{j,t} &= \alpha + \beta_1 \times Year\_1_{i,j,t} + \beta_2 \times Year\_2_{i,j,t} + \beta_3 \times Year\_3_{i,j,t} \\ &\quad + \beta_4 \times Year\_4_{i,j,t} + \beta_5 \times Year\_5_{i,j,t} + \beta_6 \times Year\_6_{i,j,t} \\ &\quad + Control_{j,t-1} + YearFE + cityFE + SecretaryFE + \varepsilon_{j,t} \end{aligned} \tag{IV.4}$$

The results are shown in Table 4, Panel B. $Year\_1$ is the missing category. Consistent with the results in Panel A, $Year\_2$'s coefficient was -0.386 at 1% significance on the total outstanding CDB loan; on average, city secretaries borrowed 38.6% less during their second year than their first year. In column 1 of Table 4, Panel B, $Year\_3$'s coefficient was -0.749, $Year\_4$'s coefficient -1.071, $Year\_5$'s -1.429, and $Year\_6$'s -1.9. Borrowing from the CDB decreased monotonically when a city secretary stayed longer in a city. In column 3 of Table 4, Panel B, the CDB loan amount in a secretary's second year was 10.9% less than the first year, and decreased monotonically over time. This pattern was also true for infrastructure and industry loans, confirming the results in Table 4 and suggesting that city secretaries borrowed more soon after they took office, and slowed borrowing monotonically over their terms. This pattern was also true for infrastructure and industry loans. I exclude cities with the same turnover cycles as the national cycle, and perform regressions with equations (IV.3) and (IV.4) again. Table A2 in the Appendix shows that for these off-national-cycle cities, city secretaries had the same borrowing patterns; they borrowed more in the first year and decreased monotonically over time. For these cities, the secretaries also borrowed more during the early term. The variation was not only from five-year national turnovers, but also from these off-cycle cities. I find similar patterns in new issuances of CDB loans.

[Place Table 4 about here]

Moreover, in Figure 3, I plot the average logarithm of CDB city total loan amounts after taking out the year fixed effects, city fixed effects, and politician fixed effects. There are three national turnover cycles during my sample period: 1998 to 2002, 2003 to 2007, and 2008 to 2010. I cluster the cities by $PoliticianYear$ for these three cycles, respectively, and calculate the average logarithm of CDB city total loan amounts for each bin in $PoliticianYear$. Figure 3 shows the "zig-zag" pattern during these three cycles. On average, city secretaries borrowed significantly more during their first year in office and monotonically decreased borrowing over time. When a new city secretary came in, the borrowing spiked again. This verifies the results in Table 4. I also look at the borrowing pattern in each city. Most of them follow this "zig-zag" pattern. It alleviates the concern that certain cities with extreme values drive the results in Table 4.

[Place Figure 3 about here]

C. Politicians' Incentives Behind the Borrowing Patterns

Section IV.B shows that city secretaries borrow significantly more during their first year in office and decrease borrowing monotonically over time. The next logical questions are: why did city secretaries intend to borrow more during the early periods of terms? What were the incentives behind these patterns? The political view suggests politicians had personal goals that did not necessary accord with social goals. In China, promotion is one of the most important career aspirations of a politician. Li and Zhou (2005) find that the likelihood of promotion of provincial leaders increased with economic performance in China between 1979 and 1995. It is well known that city secretaries' and mayors' promotions in China depend heavily on local GDP growth. Although other determinants also matter, such as political background and personal connections, GDP is one of the few aspects that can be quantified. One way to increase short-term GDP growth is to borrow from the CDB and invest. To verify the hypothesis, I regress CDB loan increase on promotion chances in the probit model:

$$\begin{aligned} pomotion_{i,j} &= \alpha + \beta_1 \times Loan\_Increase_{t,i,j} + \beta_2 \times relation_{i,j} \\ &\quad + \beta_3 \times age_{i,j} + \beta_4 \times gender_i + \varepsilon_i, \end{aligned} \tag{IV.5}$$

Each observation represents one city secretary in one city[28], where $pomotion_{i,j}$ is a dummy variable for whether city secretary i in city j got promoted during turnover. $Loan\_Increase_{t,i,j}$ is the logarithm of outstanding CDB loan increase from secretary i's first year in city j in year t. I set $t = 1, 2, 3, 4, 5$ to examine the effects from the CDB loan increased in various stages of a city secretary's term. $relation_{i,j}$ is a dummy variable for whether city secretary i in city j was from the same hometown as the provincial governor. $age_{i,j}$ is the age of secretary i in city j during the turnover year. $gender_i$ is a dummy variable for whether a city secretary i was female. Standard errors are clustered at the city level. Table A3 shows the probit

[28] Some cases exist such that the same city secretaries were in different cities. The observation is at the city/secretary level. For example, if one city secretary stayed in two cities, there are two observations for that secretary.

regression results. The CDB loan increases had positive effects on promotion. This effect was primarily from loan increases during the first two years of secretaries' terms. In columns 1 and 2 of Table A3, Panel B, the coefficients for loan increases were 0.102 and 0.087, both of which are significant. When I included later years(column 3 to 5), the coefficients were lower and less significant. *relation* had positive coefficients (column 1 to 5 of Table A3), which makes sense since promotion decisions were usually made by provincial governors. *age* had negative coefficients because older secretaries were more likely to retire and a rule states that to get promoted, a city secretary's age should be lower than 55 years.

In sum, the CDB loans had positive effects on promotion probability, and loan increases during the first two years of secretaries' terms had larger impacts on promotions. The borrowing patterns and promotions of a city secretary accord with the hypothesis that promotion is an important goal for city secretaries, and promotions depend heavily on CDB loans. In China, borrowing from the CDB has been the primary method city secretaries have used to boost local GDP during the past 15 years, and the loans take time to help the economy, so city secretaries should intend to borrow from the CDB as early as possible. One concern is that in China politicians are assigned by the Communist Party instead of being elected by voters. Politicians with good connections can be assigned to better cities and can borrow more from the CDB. Consequently, these politicians have a greater chance of promotion. To deal with this, I focus on borrowing patterns from the timing of turnover. Most city secretaries' terms are five years, and are based on duration model results; the timing of the turnover is unaffected by economic conditions and CDB loan amounts. Second, I control city secretaries' personal fixed effects during regression to remove politicians' personal time-invariant effects.

D. Second Stage: CDB City Level Loan Analysis

In the second-stage regressions, I begin by studying city secretaries' turnover effects on firm decisions. To study heterogeneous impacts on various types of firm, I separate firms into two major categories: SOEs and private firms. SOEs' primary shareholders are state and collective owners. Private firms' shareholders are private investors such as individuals and institutions. I match city secretaries' turnover data with manufacturing firms in the same city. The regression is:

$$
\begin{aligned}
Y_{l,t} &= \alpha + \beta_1 \times Year\_1_{j,t} + \beta_2 \times Year\_2_{j,t} + \beta_3 \times Year\_3_{j,t} \\
&\quad + \beta_4 \times Year\_4_{j,t} + \beta_5 \times Year\_5_{j,t} + \beta_6 \times Year\_6_{j,t} \\
&\quad + Control_{j,t-1} + YearFE + FirmFE + SecretaryFE + \varepsilon_{l,t}, \qquad \text{(IV.6)}
\end{aligned}
$$

where $Y_{l,t}$ is the dependent variables of firm l in year t such as the logarithm of total assets, number of employees, total debts, etc. $Year\_1_{j,t}, ..., Year\_6_{j,t}$ are dummy variables for years secretaries stayed in city j in year t. For example, $Year\_2_{j,t}$ equals 1 if it was the second year a secretary stayed at city j, and zero otherwise. $Control_{j,t-1}$ are variables for economic conditions such as GDP, urban income per capita, fiscal income, and working population. I control for the year fixed effects, firm fixed effects, and politician personal fixed effects. In the regressions, $Year\_1$ is the missing category. Table 5, Panel A, shows the results for SOEs. In column 1, assets of SOEs, on average, were 1.9% smaller in the second year of a city secretary's term versus the first year. The coefficients for year two to year six were also negative, and decreased monotonically. This pattern is also true for debts (column 3). In column 4, compared to a city secretary's first year, ROA increased by 1% in the city secretary's second year, and monotonically in later years. In short, on the internal margin, SOEs had more assets and debts in a city secretary's first year, and decreased overtime. For the external margin, in column 6, Table 5, Panel A, *LogExit* is the logarithm of the total number of SOEs that exit in each city annually, and controls for year fixed effect, city fixed effects, and a secretary's personal fixed effect. This shows that the number of SOEs that exit[29] the city increases over a city secretary's tenure.

Table 5, Panel B, is for private firms. In column 1, assets of private firms, on average, were 1.5% smaller during the second year of a city secretary's term versus the first year. Coefficients for years three through five were negative, and decreased monotonically. This pattern was also true for debts in column 3. However, on the external margin, the number of private firms was smaller in the first year of a city secretary's term and increased over the secretary's tenure. Moreover, the number of private firms that exited the city was bigger in the first year of a city secretary's term and decreased over the secretary's tenure. Results in

[29]CIC data contain all manufacturing firms with annual sales greater than \$700,000. If a firm was dropped from the data, it either went bankrupt or had annual sales smaller than \$700,000.

Table 5 Panel B suggest that, on average, private firms were crowded out during the earlier periods of city secretaries' terms, but the remaining firms grew. These different effects from turnover might suggest that different types of CDB credit have different effects on private firms. CDB credit might also affect private firms differently at different levels of the supply chain.

Overall, the evidence in Tables 4 and 5 suggests that CDB credit makes more SOEs survive but crowds out more private firms on the external margin. These opposing effects mitigate the concern that the timing of city secretary turnovers is driven by changing investment opportunities in a city. For private firms, CDB credit crowds in firms on the internal margin but crowds out private firms in the external margin. It is important to separate the different types of credit.

[Place Table 5 about here]

Next, I separate CDB loans into infrastructure- and industry-firm loans. I perform 2SLS, and use $Year\_1_{i,j,t}, ..., Year\_6_{i,j,t}$ as instrumental variables for both CDB infrastructure and industry loans[30]. Table 6 shows the 2SLS regression results. Interestingly, CDB infrastructure loans helped private firms by increasing their assets, and industry loans crowded private firms. In columns 1 to 6 in Table 6, Panel A, for private firms, CDB infrastructure loans increased assets, number of workers, debts, sales per worker, and total sales. CDB industry loans decreased assets, sales per worker, and total sales. From these results, infrastructure loans supplemented private firms, but industry loans, which usually go to SOEs, hurt private firms. In sum, city secretaries borrowed more during the early years of their terms, at a time during which SOEs increased their assets and debts and became less efficient. For the private sector, there were fewer private firms. Moreover, infrastructure loans helped both SOEs and private firms. Industry loans crowded private firms.

[30]Turnover timing is the only exogenous variation source I use. I separate the $PoliticianYear$ into six categorical dummies and use them as my instruments. One concern is that I have only one exogenous variation source but two endogenous variables. In Table 4, cities have "zig-zag" borrowing patterns on both infrastructure loan and industry loan. This means the political turnover timing is the shock to both types of the credit. Moreover, industry credit is more sensitive to turnover timing. For the weak identification test, I report the Cragg-Donald Wald F-statistics in Table 6.

[**Place Table 6 about here**]

In China, it is debatable whether political turnover correlates with other macro variables that influence local economies. The variation I use is from the varying political cycles among cities. I control year fixed effects to remove the effects from the national turnover cycle. The opposing effects of CDB infrastructure loan and industry SOE loan mitigate the concern that other things related to turnover timing drive these results. For example, the political uncertainty could be high before turnover and lower after the new secretary takes office. Firms do not want to expand and invest before the turnover. However, if that is the case, both CDB infrastructure and industry loans would crowd out the private sector in a 2SLS setting. The opposing effects between the CDB infrastructure loan and industry SOE loan could further suggest that the crowding out/in effects are from the credit supply rather than the demand side. Moreover, the other concern is that the credit from commercial banks might be associated with turnover timing. Different commercial banks in China usually focus on different industries. Controlling industry time trends could mitigate this concern. Panel B in Table 6 shows that the results are robust by controlling the industry time trends.

E. Politician's Other Channels to Affect Local Economy

Another concern is whether CDB loans are the only way a city secretary can affect the economy; does the exclusion condition hold that local political turnover only affects the economy through CDB borrowing? When new city secretaries come to their cities, they usually have their own plans or preferences to develop local economies, and they have several tools to do this. For example, a secretary can build business districts to attract investment, speed up approvals of city projects, provide better government services, etc. However, the biggest constraint is limited fiscal income. Local governments in China share only 20% to 30% of tax revenue, and are responsible for infrastructure buildup. City secretaries have many good projects piled on the desks, but they require financial resources. There are three common ways to raise money: borrowing from the CDB, selling more land, and asking for more transfers. In China, there are many pro-economic policies that are determined by the central government such as export tax rebates, corporate tax breaks for foreign companies and export companies, etc. City secretaries enforce these policies disparately. For example,

they can simply give tax breaks to more firms.

To rule out these channels, I repeat the first-stage regressions and regress the variable $PoliticianYear$ on developed land, export amounts, fiscal income, average effective corporate taxes, and average effective value-added tax for each city. Table A4 shows there were no effects of turnover timing on these other things. However, it might take some time for a politician to act and affect local economies. To address this concern, I use a lagged $PoliticianYear$ instead and find no correlations, suggesting city secretaries do not sell more land to raise money, encourage exportation, increase fiscal income, or lower tax rates[31] during their early terms.

Moreover, I explore various effects of turnover timing in cities with different CDB loan levels. In Panel A of Table A5, I interact $PoliticianYear$ with the dummy variable $HighCDB$ for whether a CDB loan amount was above the median of all CDB loans in 310 cities from 1998 to 2009. I regress them on SOE variables. The interaction term $PoliticianYear$ and $HighCDB$ had negative coefficients with total assets, employment, debts, and sales per worker, suggesting turnover timing had larger effects when CDB loans were high. The main effects of $PoliticianYear$ did not have significant coefficients, so most of the effects of turnover timing were from high CDB loan areas. Panel B in Table A5 is restricted to SOEs with zero CDB loans in the city. There are no significant coefficients with $PoliticianYear$ in these zero CDB loan areas. This suggests that political turnover timing doesn't have significant effects on firms when there is no CDB loan in the city. These results further support the exclusion conditions of turnover timing.

F. CDB Industry Loan Analysis

F.1 Industry loan's effect on firms in the same industry

Section IV.D shows that at the city level, CDB loans for infrastructure help private firms grow. However, industry firm loans crowd the private sector. This section uses province-industry level loan data and explores more industry loan effects. The data offer the advantage of analyzing the effects of government credit on industries, and effects on related industries. Most extant studies are based on aggregate government credits or spending.

[31] Export tax rebates offer a huge benefit for export firms in China, and the government gives part of the value-added tax or sales taxes back to firms. This is reflected by Tax_VAT in Table A4

Most CDB industry firm loans go to SOEs; approximately 90% of total industry loans are for them. In China, cities in the same province usually focus on different industries, especially for SOEs that adjust more slowly than those in the private sector. I aggregate total assets of SOEs at the city-industry level each year and pick out the largest industry in each city. On average, only two cities in the same province focused on the same industry, and the city usually stuck to the same industry over time. Among 310 cities, 42% did not change industries from 1998 to 2009. 40% changed once, 14% twice, and only 3% more than twice.

Based on these findings, I again use city-level turnover as a shock to CDB industry loans at the province level. I mark each city with its largest SOE industry annually. If city secretaries were in their earlier terms and based on previous conclusions, the city usually borrowed more industry firm loans for SOEs from the CDB. I consider it a shock to a province-level CDB loan on the industry that is the largest SOE industry in the city. For example, city A in province B focuses on industry C. If city A's current secretary is in an earlier term, I consider it a shock to CDB loans of industry C in province B that year. Since cities in the same province usually focus on different industries, and the largest SOE industry in a city does not change often over time, if a city borrows more for its SOEs, it should be reflected in the province-level CDB loan in the industry. Formally, the regression is:

$$\begin{aligned} LogLoan\_PI_{k,p,t} &= \alpha + \beta_1 \times First_{k,p,t} + \beta_2 \times Second_{k,p,t} + \beta_3 \times Third_{k,p,t} \\ &\quad + \beta_4 \times Fourth_{k,p,t} + \beta_5 \times Fifth_{k,p,t} + \beta_6 \times Sixth_{k,p,t} + \\ &\quad Control_{p,t-1} + YearFE + provinceFE + IndustryFE + \varepsilon \end{aligned} \quad \text{(IV.7)}$$

where $LogLoan\_PI_{k,p,t}$ is the logarithm of CDB outstanding loan amount in industry k, province p in year t. $First_{k,p,t}$ is a dummy variable that equals 1 if there is a city that focuses on industry k in province p that has a secretary who is in her first year. $Second_{k,p,t}$ is a dummy variable that equals 1 if a city focuses on industry k in province p that has a secretary who is in her second year. $Third_{k,p,t}$ to $Sixth_{k,p,t}$ are defined similarly. $Control_{p,t-1}$ includes lagged GDP, urban income per capita, fiscal income, and working population in province p. I control year, province, and industry fixed effects. Regression results are shown in Table A6. In the first column of Table A6, CDB industry loans are larger if a city that focused on this industry had a secretary who was in her early term; $First_{k,p,t}$, $Second_{k,p,t}$,

and $Third_{k,p,t}$ had positive coefficients. I also combine the first two or three years and create the dummy variables $First-Second_{k,p,t}$ and $First-Third_{k,p,t}$. In columns 2 and 3 of Table A6, these two variables also had positive coefficients. On average, a province borrowed 33.2% more from the CDB for an industry that focused on cities that had secretaries in the first three years of their terms. City secretaries borrowed more for a city's top SOE industry during their early terms, which is consistent with previous results that suggest secretaries borrowed more during an earlier term.

Next, I use $First_{k,p,t}$ to $Sixth_{k,p,t}$ to instrument $LogLoan\_PI_{k,p,t}$ and perform 2SLS. I include all control variables such as economic variables $Control_{p,t-1}$, year-fixed effects, and firm-fixed effects during first-stage regressions. The second-stage regression is:

$$Y_{l,k,p,t} = \alpha + \beta \times \widehat{LogLoan\_PI}_{k,p,t} + Control_{p,t-1} + YearFE + FirmFE + \varepsilon_{l,t}, \quad \text{(IV.8)}$$

where $Y_{l,k,p,t}$ are the dependent variables of firm l in industry k province p in year t such as the logarithm of total assets, economic condition variables, and year-fixed and firm-fixed effects. Panel A of Table 7 shows the 2SLS regression results for private firms. In columns 1 to 3 and 5 to 6, CDB industry firm loans had negative effects on private firms' total assets, employment, debts, sales per worker, and total sales. When industry loans doubled, private firms in the same industry, on average, decreased assets by 17.1%, decreased employment by 9.7%, decreased debts by 20.1%, decreased sales per worker by 17.4%, and decreased total sales by 26.3%. In column 4 of Table 7 Panel A , CDB industry firm loans had positive effects on private firms' ROAs. Panel B of Table 7 shows the 2SLS regression results for SOEs. Again, industry loans helped SOEs increase total assets, employment, debts, sales per worker, and total sales. When industry loans doubled, SOEs in the same industry, on average, increased assets by 13.6%, increased employment by 13.0%, increased debts by 30.4%, increased sales per worker by 2.3%, and increased total sales by 12.6%. In sum, CDB industry loans make SOEs grow larger and sell more. Contrarily, private firms shrink in size and sell less. Since CDB industry firm loans usually go to SOEs, it is not surprising that SOEs become stronger and crowd the private sector. The results from 2SLS are consistent with the OLS results in Table 2.

[Place Table 7 about here]

F.2 Industry loan's effect on firms in the related industries

It is well known that China's economy grew dramatically during the past two decades, and the private sector was the primary driver of this growth. Although government credit crowds the private sector in the same industry, it might complement the private sector in related industries. The CDBs strategy is to aid basic industries such as energy and mining to help related industries. For this sector, I use an input-output matrix to identify inter-industry relationships and study spillover effects of government credit. I use the national input-output matrix from 2007 from the National Bureau of Statistics of China to define upstream and downstream industries[32]. The input-output matrix has 42 industries, and the CDB classifies its loans into 95 industries, which is more detailed. I match these two industry classifications by combining CDB industries. For each industry, I pick the largest intermediate input from other industries as the upstream industry. At the firm level, I match each firm with its upstream industry CDB loan in the same province. After the merger, there were 25 industries in the manufacturing sector. Again, I use city-level turnover dummy variables to instrument $UpstreamLoan$ and perform 2SLS. The first-stage regression is:

$$\begin{aligned} LogUpstreamLoan_{l,k',p,t} &= \alpha + \beta_1 \times First_{k',p,t} + \beta_2 \times Second_{k',p,t} + \beta_3 \times Third_{k',p,t} \\ &\quad + \beta_4 \times Fourth_{k',p,t} + \beta_5 \times Fifth_{k',p,t} + \beta_6 \times Sixth_{k',p,t} \\ &\quad + Control_{p,t-1} + YearFE + FirmFE + \varepsilon_{l,t}, \end{aligned} \tag{IV.9}$$

where $LogUpstreamLoan_{l,k',p,t}$ is the logarithm of CDB outstanding loan amount in the upstream industry of firm l in industry k, province p in year t. k' indexes the upstream industry of k. $First_{k',p,t}$ is a dummy variable that equals 1 if there was a city that focused on industry k' in province p and had a secretary who was in the first year. $Second_{k',p,t}$ to $Sixth_{k',p,t}$ are defined similarly. The second-stage regression is:

$$Y_{l,k,p,t} = \alpha + \beta \times \widehat{LogUpstreamLoan}_{k',p,t} + Control_{p,t-1} + YearFE + FirmFE + \varepsilon_{l,t}, \tag{IV.10}$$

[32] I also use other years' input-output matrices to double check the definition of upstream and downstream industries and assess the same inter-industry relationships that do not change much over time.

where $Y_{l,k,p,t}$ are the dependent variables of firm l at year t, which is in industry k, province p. $\widehat{LogUpstreamLoan}_{k',p,t}$ is the estimated CDB loan to upstream industry k'. k' indexes the upstream industry of k. Panel A of Table 8 shows the results for private firms. Generally, CDB loans to firms' upstream industry helped the private sector. In columns 1, 3, 5, and 6 of Panel A, Table 8, the upstream CDB industry firm loan had positive effects on private firms' total assets, debts, sales per worker, and total sales. When the upstream industry loan doubled, private firms in the downstream, on average, increased assets by 6.4%, increased debts by 3.2%, increased sales per worker by 4.4%, and increased total sales by 4.9%. However, there was no change in employment or ROA. Moreover, in Table 8 Panel B, I interact the *LogUpstreamLoan* with dummy *Connected* for whether the private firms' political hierarchy is above the city level or not[33]. In China, all firms (including private firms) have a political hierarchy that defines which level of the government the firm needs to report to. In other words, it determines which level of government the firm is affiliated with. For example, a city-level firm is one that is under a city government and reports to that government. From the regression results in Table 8, private firms with better political connections can benefit significantly from upstream loans. This means that although CDB upstream loans have positive effects on downstream private firms, the connected private firms can benefit significantly more. Table 8, Panel C, shows the results for SOEs. Generally, CDB loans to firms' upstream industry also helped SOEs. In columns 1 to 3 and 7 of Table 8, Panel C, upstream CDB industry firm loans had positive effects on SOEs' total assets, employment, debts, and total sales. When the upstream industry loan doubled, SOEs in the downstream, on average, increased assets by 8.5%, increased employment by 8.7%, increased debts by 13.2%, and increased total sales by 5.8%. However, SOEs' sales per worker decreased. In columns 4 and 5 of Table 8, Panel C, ROA and sales per worker both decreased. Although both the private sector and SOEs grew, unlike private firms, SOEs hired more workers and experienced lower efficiency.

[Place Table 8 about here]

[33] In order to include the interaction term $Log(Upstream\_Loan) * Connected$ in 2SL, I follow Wooldridge (2002). I first regress instrumental variables($First$ to $Sixth$) on $Log(Upstream\_Loan)$ with all exogenous variables and get fitted value $\widehat{Log(Upstream\_Loan)}$. Second, I use $\widehat{Log(Upstream\_Loan)}$ and $\widehat{Log(Upstream\_Loan)} * Connected$ as instrumental variables for $Log(Upstream\_Loan)$ and $Log(Upstream\_Loan) * Connected$, and perform the standard 2SLS again.

G. Overall Effects of the Government Credit from CDB

From the analyses above, it is clear CDB infrastructure loans help both SOEs and private firms. CDB industry loans that usually go to SOEs expand SOEs but crowd private firms in the same industry. Upstream CDB industry loans help private firms in downstream industries. What are the overall effects of government credit from the CDB?

One component of the CDB's mandate is to help basic industries. Although CDB industry loans crowd the private sector in the same industry, they help private firms in downstream industries grow. I use estimated coefficients and various types of CDB credits to study the overall effects. In column 1 of Table 6, Panel A, the coefficient of CDB city-level infrastructure loans on private firms' total assets was 0.246, which means one unit increase in the logarithm of CDB city infrastructure loans increases the logarithm of each private firm's assets by 0.246 in the same city. For industry loans, column 1 of Table 7 Panel A shows that one unit increase in the logarithm of CDB province industry loans decreases the logarithm of each private firm's assets by 0.246 in the same province and industry. Column 1 of Table 8, Panel A, shows that one unit increase in the logarithm of CDB province upstream industry loans increases the logarithm of each private firm's assets by 0.092 in the same province and industry. Based on these coefficients and changes to CDB loans in infrastructures and industries, I find that, on average, total CDB credit increased private firms' assets by 3.4% annually from 1998 to 2009. During the same period, the average annual growth rate of private firms' assets was 15.4%. Therefore, CDB loans contributed about 22% to private sector growth from 1998 to 2009. On average, a $1 million increase in a CDB total outstanding loan amount led to a $0.33 million increase in private firms' total assets. If I exclude infrastructure loans, then from 1998 to 2004, CDB industry loans increased private firms' assets from 2% to 7% annually, and a $1 million increase in the CDB outstanding industry loan amount led to a $0.43 million increase in private firms' total assets. From 2005 to 2009, CDB industry loans decreased private firms' assets from 2% to 5% annually and a $1 million increase in the CDB outstanding industry loan amount led to a $0.89 million decrease in private firms' total assets. Overall, from 1998 to 2009, a $1 million increase in the CDB outstanding industry loan amount led to a $0.52 million decrease in private firms' total assets.

Sales per worker is an important measurement of efficiency in China, especially in the manufacturing sector. An abundant labor supply makes labor costs cheaper in China, one of the most important reasons for the dramatic growth in exports and the economy as a

whole. Most manufacturing firms in China are labor intensive. Higher sales per worker mean a firm can do more with fewer workers. From the results in Tables 6, 7, and 8, CDB infrastructure loans increased sales per worker for private firms, and CDB industry loans decreased sales per worker for private firms in the same industry. CDB loans to upstream industries increased sales per worker for private firms in downstream industries. Based on these coefficients, I find that, on average, total CDB credits increased private firms' sales per worker by 10.8% annually from 1998 to 2009. During the same period, the average annual growth rate of sales per worker in private firms was 20%. Therefore, from 1998 to 2009, CDB loans contributed more than 50% to the growth of the private sector's sales per worker. If I exclude infrastructure loans, then from 1998 to 2004, CDB industry loans increased private firms' sales per worker from 2% to 9% annually. From 2005 to 2009, CDB industry loans decreased private firms' assets from 6% to 9% annually.

I further explore the reasons behind disparate credit effects during various periods. Figure 4 plots total CDB loan issuances between 1998 and 2010 for the top six industries. In 1998, electric power supply and coal mining were the top two industries, followed by petroleum and natural gas extraction, oil processing and refining, chemical products, etc. Except for transportation equipment manufacturing, all of these were upstream industries. Manufacturing firms were usually direct downstream industries. The dominant weight on upstream industries can have large positive spillover effects on downstream industries, one reason industry credit can have positive effects on the private sector during earlier years. In 2010, and after 12 years, the top industries of CDB loans changed. Electric power supply is still the top industry of CDB loan issuances. However, three of the top six industries are in the manufacturing sectors. Electronic equipment manufacturing ranks third, but was not included in the top six industries back in 1998. Special equipment manufacturing[34] ranks fourth, and transportation equipment manufacturing ranks sixth. This could lead to bigger crowding effects in the manufacturing industries, and smaller spillover effects for downstream industries. This might explain why CDB industry loans had positive effects on the private sector during earlier years, and negative effects during later years. Over the past 20 years, China has experienced dramatic GDP growth, and there have been many shortages, such as energy supply and mining. CDB loans in upstream industries have helped solve these demand constraints, possibly explaining why CDB industry loans can help the private sector grow

[34] Special equipment includes equipment for mining, agriculture, medical, clothing, etc.

faster and become more efficient during its early years. However, in later years, the CDB has focused less on basic industries, shifting to other industries such as electronic equipment. CDB loans to infrastructure have always helped a firm grow and improve efficiency. Although there are increasingly new, modern cities in China, urbanization is far from over.

[Place Figure 4 about here]

V Conclusion

This paper explores the different effects of various types of government credit (infrastructure vs. industry credit). It traces the effect of government credit across different levels of the supply chain. Using unique detailed industry loan data from the China Development Bank, I find that government credits to infrastructure help firms expand in size, debt, employment, and sales per worker. Government credits to industries, which usually go to SOEs, help SOEs expand, but crowd private firms in the same industry. However, from 1998 to 2009, these industry loans help private firms in downstream industries. Overall, government credit from the CDB supplemented the private sector with a contribution of approximately 22% to private sector growth. These results shed light on prior mixed empirical findings. I use municipal politicians' turnover timing as an instrument for loans from the CDB. I find that city secretaries borrowed more during their early terms, and I provide evidence that accords with the hypothesis that promotion is the incentive behind politicians' borrowing patterns.

Although direct costs of government credit (e.g., credit default) are essential for evaluating government credit programs, they are beyond the scope of this paper. In future research, it will be important to value the costs of these government loans to evaluate overall costs and benefits. Local-government indebtedness has a direct impact on housing prices and the shadow banking system in China. How does government credit affect households in China? What is the relationship between government credit and China's shadow banking system? Answers to these questions will elucidate China's government credit and the larger picture of the country's economy.

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Table 1
Summary Statistics Data

Panel A: City Data

Variable	N	Mean	S.D.	Min	Max
Loan_City	3,605	31.97	69.01	0.00	1,268.20
Issuance_City	3,605	11.31	26.76	0.00	428.79
Loan_INF_City	3,605	10.92	30.37	0.00	593.74
Issuance_INF_City	3,605	4.20	12.21	0.00	195.03
Loan_IND_City	3,605	21.34	51.54	0.00	847.77
Issuance_IND_City	3,605	7.13	18.77	0.00	284.22
GDP	3,587	559.46	782.80	0.00	10,604.48
AvgIncome	3,568	10,799.02	8,047.79	0.00	139,574.00
FiscalIncome	3,587	30.43	60.98	0.00	1,138.31
Employment	3,579	1,108.81	18,000.38	0.00	329,858.30
PoliticianYear	3,605	2.49	1.32	1.00	6.00
Age	3,325	50.11	4.22	32.00	62.00
Gender	3,605	0.01	0.10	0.00	1.00
Relation	3,158	0.08	0.28	0.00	1.00
Promotion	3,605	0.38	0.48	0.00	1.00

Panel B: Province Data

Variable	N	Mean	S.D.	Min	Max
Loan_PI	44,733	8.09	43.33	0.00	1,369.09
Issuance_PI	44,733	2.81	16.23	0.00	1,004.12
Loan_Road	496	154.18	163.63	0	744.87
Loan_Rail	496	51.44	102.32	0	1260.99
Loan_Water	496	12.60	23.95	0	203.29
Loan_Tel	496	8.55	41.03	0	419.93

Panel C: Firm Data

Variable	N	Mean	S.D.	Min	Max
LogAsset	2,949,514	9.72	1.48	0.00	20.16
LogWorker	2,944,543	4.69	1.17	0.00	12.58
LogDebt	2,930,818	8.98	1.73	0.00	19.32
ROA	2,949,502	0.09	0.20	-0.76	2.44
Log(Sales/Worker)	2,918,158	5.25	1.24	-8.12	17.38
LogSales	2,931,478	9.95	1.46	0.00	19.24
Tax_Corp	1,520,597	19.41	10.24	0.00	61.54
Tax_VAT	1,356,623	15.09	13.92	0.00	86.91

Note. Panel A is at city × year level. It covers 310 cities from 1998 to 2010. It is from the CDB city level data and the municipal politician profile data. Panel B restricted to 31 provinces from 1998 to 2013 among 95 industries. It is from the CDB province level data. Panel C restricted to all manufacturing firms in Chinese Industry Census data from 1998 to 2009. It is from the Chinese Industrial Census data. For more detailed variable definition and construction, please see Table A1.

Table 2
CDB Loan's Effect on Firms: Evidence from OLS Regressions

Panel A: Industry Loan on SOEs

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable	LogAsset	LogWorker	LogDebt	ROA	Log(Sales/Worker)	LogSales
Log(Loan_PI)	0.006***	0.010***	0.017***	-0.002***	-0.010***	-0.001
	(0.002)	(0.002)	(0.003)	(0.001)	(0.003)	(0.003)
$Control_{t-1}$	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Firm Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Observations	231,682	232,003	229,696	231,682	225,214	227,342
R-squared	0.093	0.028	0.054	0.008	0.189	0.152

Panel B: Industry Loan on Private Firms

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable	LogAsset	LogWorker	LogDebt	ROA	Log(Sales/Worker)	LogSales
Log(Loan_PI)	-0.003**	-0.007***	0.003*	-0.004***	-0.016***	-0.022***
	(0.001)	(0.001)	(0.002)	(0.000)	(0.001)	(0.001)
$Control_{t-1}$	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Firm Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Observations	756,826	757,033	752,871	755,947	756,820	755,687
R-squared	0.219	0.013	0.081	0.033	0.225	0.273

Panel C: Infrastructure Loan on Private Firms

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable	LogAsset	LogWorker	LogDebt	ROA	Log(Sales/Worker)	LogSales
Log(Loan_INF_City)	0.013***	-0.010***	0.009**	0.002***	0.041***	0.032***
	(0.003)	(0.002)	(0.004)	(0.001)	(0.003)	(0.003)
$Control_{t-1}$	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Firm Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,022,595	1,022,954	1,016,623	1,022,586	1,021,059	1,021,245
R-squared	0.215	0.034	0.091	0.058	0.245	0.281

Note. In Panel A and B, $Loan\_PI$ is at province× industry× year level. It is the CDB industry loan (to SOEs) amount at each of the 31 provinces and 41 manufacturing industries. In Panel A, data is restricted to SOEs in CIC data from 1998 to 2009. It shows the OLS regression results by estimating equation IV.1. In Panel B, data is restricted to private firms in CIC data from 1998 to 2009. $Control_{t-1}$ include province level GDP, income per capita, fiscal income and total employment in the previous years.In Panel C, $Loan\_INF\_City$ is the CDB infrastructure loan amount at city × year level. Data is restricted to private firms in CIC data from 1998 to 2009 among 310 cities. $Control_{t-1}$ include city level GDP, income per capita, fiscal income and total employment in the previous years. Standard errors are clustered at firm level.

Table 3
Exogeneity of City Secretary Turnover Timing

	(1) Coefficient	(2) Coefficient	(3) Coefficient	(4) Coefficient	(5) Hazard Ratio
NationalCycle	0.366***	0.340***	0.363***	0.332***	1.393
	(0.061)	(0.064)	(0.063)	(0.065)	
Age		0.019**		0.018**	1.019
		(0.008)		(0.008)	
Gender		0.123		0.133	1.142
		(0.293)		(0.297)	
GDP_{t-1}	-0.058	-0.065	0.087	0.044	1.045
	(0.064)	(0.067)	(0.462)	(0.459)	
GDP_{t-2}			-0.164	-0.118	0.888
			(0.536)	(0.537)	
$AvgIncome_{t-1}$	-0.001	-0.001	0.002	-0.000	1.000
	(0.003)	(0.004)	(0.011)	(0.011)	
$AvgIncome_{t-2}$			-0.003	-0.000	1.000
			(0.012)	(0.012)	
$FiscalIncome_{t-1}$	0.807	0.769	2.167	2.755	15.722
	(0.837)	(0.857)	(4.034)	(3.936)	
$FiscalIncome_{t-2}$			-1.658	-2.457	0.086
			(4.720)	(4.634)	
$Employment_{t-1}$	0.000	0.000	-0.008	-0.006	0.994
	(0.001)	(0.001)	(0.010)	(0.009)	
$Employment_{t-2}$			0.009	0.007	1.007
			(0.010)	(0.009)	
$Log(Loan\_City_{t-1})$	0.002	0.001	0.028	0.033	1.033
	(0.018)	(0.019)	(0.043)	(0.048)	
$Log(Loan\_City_{t-2})$			-0.025	-0.030	0.970
			(0.041)	(0.045)	
Observations	3,012	2,775	2,878	2,652	2,652
Chi Squared	36.84	38.07	36.51	34.91	34.91

Note. The regressions are estimated at city × year level. Data restricted to 1,106 city secretaries among 310 cites from 1998 to 2011. Table shows the results from Cox proportional hazard regression by following Wooldridge(2002). Estimated coefficients are reported in column 1 to 4. *Age* is the city secretary's age. *Gender* is the dummy for whether the city secretary is female or not. $NationalCycle$ is the dummy for whether it is the year of national congress party(1998, 2003 and 2008). GDP, $AvgIncome$, $FiscalIncome$ and *Employment* are city level GDP, income per capita, fiscal income and total employment respectively. $Log(Loan\_City)$ is the logarithm of CDB city level total outstanding loan amount. Column 1 and 3 excludes *Gender* and *Age* of the city secretaries since these two variables has many missing values. Column 5 is the estimated hazard ratio from column 4. Standard errors are clustered at city secretary's level.

Table 4
City Secretary Turnover Timing's Effect on Borrowing from CDB (First Stage)

Panel A

	Total Loan		Loan for Infrastructure		Loan for Industry Firms	
	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable	Log(Loan_City)	Log(Issuance_City)	Log(Loan_City)	Log(Issuance_City)	Log(Loan_City)	Log(Issuance_City)
PoliticianYear	-0.364***	-0.308***	-0.122***	-0.165***	-0.338***	-0.252***
	(0.020)	(0.029)	(0.013)	(0.025)	(0.028)	(0.037)
$Control_{t-1}$	Yes	Yes	Yes	Yes	Yes	Yes
Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,127	2,795	2,449	2,227	2,727	2,323
R-squared	0.853	0.685	0.884	0.588	0.756	0.597

Panel B

	Total Loan		Loan for Infrastructure		Loan for Industry Firms	
	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable	Log(Loan_City)	Log(Issuance_City)	Log(Loan_City)	Log(Issuance_City)	Log(Loan_City)	Log(Issuance_City)
Year_2	-0.386***	-0.357***	-0.109***	-0.167***	-0.330***	-0.327***
	(0.031)	(0.057)	(0.028)	(0.063)	(0.044)	(0.081)
Year_3	-0.749***	-0.660***	-0.240***	-0.298***	-0.703***	-0.540***
	(0.042)	(0.074)	(0.035)	(0.070)	(0.064)	(0.099)
Year_4	-1.071***	-0.912***	-0.351***	-0.509***	-1.001***	-0.731***
	(0.063)	(0.089)	(0.041)	(0.082)	(0.086)	(0.123)
Year_5	-1.429***	-1.318***	-0.467***	-0.691***	-1.341***	-1.238***
	(0.108)	(0.168)	(0.081)	(0.172)	(0.151)	(0.216)
Year_6	-1.900***	-1.581***	-0.691***	-0.870***	-1.668***	-1.337***
	(0.144)	(0.196)	(0.110)	(0.218)	(0.204)	(0.240)
$Control_{t-1}$	Yes	Yes	Yes	Yes	Yes	Yes
Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,127	2,795	2,449	2,227	2,727	2,323
R-squared	0.854	0.685	0.884	0.588	0.756	0.599

Note. The regressions are estimated at city × year level in 310 cites from 1998 to 2010. Panel A shows the results from OLS regression from equation IV.3. $PoliticianYear$ is the number of years that the secretary has been staying in the city. Column 1 and 2 are for the total CDB loan outstanding amount and total issuance respectively. It is separated into infrastructure loans and SOE loans in column 3 to 6. In Panel B, $Year\_2$ is the the dummy for whether it is the second of the secretary in the city. $Year\_3$ is the the dummy for whether it is the third of the secretary in the city. $Year\_4$ to $Year\_6$ are defined in the same way. The dummy for year 1 is the missing category. $Control_{t-1}$ include city level GDP, income per capita, fiscal income and total employment in the previous years. All columns are controlled by year fixed effect, city fixed effect and politician personal fixed effect. Standard errors are clustered at city level.

Table 5
City Secretary's Turnover Effects on Firms

Panel A: SOEs						
	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable	LogAsset	LogWorker	LogDebt	ROA	LogNumber	LogExit
Year_2	-0.019***	-0.006	-0.028***	0.010***	0.019	0.062
	(0.007)	(0.006)	(0.010)	(0.002)	(0.015)	(0.044)
Year_3	-0.032**	-0.021*	-0.043**	0.017***	0.056***	0.099*
	(0.013)	(0.012)	(0.019)	(0.003)	(0.018)	(0.052)
Year_4	-0.047**	-0.025	-0.065**	0.024***	0.076***	0.197***
	(0.020)	(0.017)	(0.028)	(0.005)	(0.024)	(0.056)
Year_5	-0.075***	-0.031	-0.097**	0.028***	0.035	0.175*
	(0.027)	(0.023)	(0.038)	(0.007)	(0.049)	(0.094)
Year_6	-0.091***	-0.044	-0.128***	0.035***	0.070	0.614***
	(0.034)	(0.030)	(0.048)	(0.008)	(0.050)	(0.113)
$Control_{t-1}$	Yes	Yes	Yes	Yes	Yes	Yes
Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	382,317	381,720	378,567	382,318	3,250	2,863
R-squared	0.108	0.0642	0.0647	0.0437	0.963	0.629
Panel B: Private Firms						
	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable	LogAsset	LogWorker	LogDebt	ROA	LogNumber	LogExit
Year_2	-0.015***	-0.004	-0.012*	-0.003***	0.085***	-0.102***
	(0.005)	(0.004)	(0.007)	(0.001)	(0.019)	(0.038)
Year_3	-0.032***	-0.005	-0.038***	-0.003	0.144***	-0.167***
	(0.009)	(0.008)	(0.013)	(0.002)	(0.021)	(0.045)
Year_4	-0.058***	-0.013	-0.070***	0.002	0.177***	-0.267***
	(0.014)	(0.011)	(0.019)	(0.003)	(0.030)	(0.053)
Year_5	-0.096***	-0.025*	-0.095***	0.006	0.212***	-0.361***
	(0.019)	(0.015)	(0.025)	(0.004)	(0.056)	(0.106)
Year_6	-0.081***	0.002	-0.111***	0.008	0.283***	-0.333***
	(0.024)	(0.019)	(0.032)	(0.005)	(0.053)	(0.111)
$Control_{t-1}$	Yes	Yes	Yes	Yes	Yes	Yes
Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,171,115	1,171,449	1,163,749	1,171,106	3,233	2,804
R-squared	0.234	0.0317	0.103	0.0625	0.974	0.753

Note. Data restricted to manufacturing firms in Chinese Industry Census data from 1998 to 2009 among 310 cities. $Year\_2$ to $Year\_6$ are at the city × year level. Panel A is for SOEs. Panel B is for private firms. Column 1 to 4 are the logarithm of total asset , total number of workers, total debt, and the ROA of the firm. The dummy for year 1 is the missing category. $Control_{t-1}$ include city level GDP, income per capita, fiscal income and total employment in the previous years.Column 1 to 4 are controlled by year fixed effect, firm fixed effect and politician personal fixed effect. Standard errors are clustered at firm level. Column 5 is the logarithm of total number of firms in each city every year. Column 6 is the logarithm of total number of firms exit in each city every year.Column 5 and 6 is controlled by year fixed effect, city fixed effect and politician personal fixed effect. Standard errors are clustered at city level.

Table 6
Opposing Effects of CDB City Infrastructure Loan and Industry Loan on Private Firms (Use Secretary Year in Office as Instrument)

Panel A						
	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable	LogAsset	LogWorker	LogDebt	ROA	Log(Sales/Worker)	LogSales
Log(Loan_IND_City)	-0.073***	-0.021	0.005	0.001	-0.134***	-0.146***
	(0.016)	(0.014)	(0.023)	(0.005)	(0.018)	(0.019)
Log(Loan_INF_City)	0.246***	0.052*	0.161***	-0.023**	0.544***	0.576***
	(0.033)	(0.028)	(0.047)	(0.009)	(0.037)	(0.039)
Control_{t-1}	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Firm Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Politician Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Observations	851,720	852,039	846,406	851,712	850,374	850,546
Wald F-stat	474.3	477.2	471.5	474.4	478.0	475.8
Panel B: Control Industry Trend						
	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable	LogAsset	LogWorker	LogDebt	ROA	Log(Sales/Worker)	LogSales
Log(Loan_IND_City)	-0.062***	-0.009	0.018	0.005	-0.126***	-0.127***
	(0.015)	(0.014)	(0.023)	(0.005)	(0.018)	(0.018)
Log(Loan_INF_City)	0.221***	0.015	0.136***	-0.029***	0.521***	0.518***
	(0.033)	(0.028)	(0.047)	(0.009)	(0.036)	(0.039)
Control_{t-1}	Yes	Yes	Yes	Yes	Yes	Yes
Year× Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Politician Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Observations	851,720	852,039	846,406	851,712	850,374	850,546
Wald F-stat	389.1	390.0	387.0	389.2	391.1	390.4

Note. Table 6 are the two stage least squares results by using $Year\_1$ to $Year\_6$ as instrumental variable for logarithm of CDB loan for infrastructure and industry SOEs at city×year level. $Log(Loan\_INF\_City)$ is the logarithm of the aggregate loan for infrastructure at city × year level. $Log(Loan\_IND\_City)$ is the logarithm of the aggregate loan for industry firms at city × year level. Data restricted to the private firms in CIC from 1998 to 2009 among 310 cities. In column 5, $LogSales/Worker$ is the logarithm of Sales per worker. Control_{t-1} include city level GDP, income per capita, fiscal income and total employment in the previous years. Standard errors are clustered at firm level. Cragg-Donald Wald F-statistics for weak identification tests are reported. Panel A are controlled by year fixed effect, firm fixed effect and politician personal fixed effect. Panel B are controlled by interaction of year and industry fixed effect, firm fixed effect and politician personal fixed effect.

Table 7
CDB Province Industry Loan's Effect on Firms within Same Industry (2SLS)

Panel A: Private Firms

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable	LogAsset	LogWorker	LogDebt	ROA	Log(Sales/Worker)	LogSales
Log(Loan_PI)	-0.246***	-0.140***	-0.290***	0.020**	-0.251***	-0.380***
	(0.034)	(0.027)	(0.047)	(0.009)	(0.037)	(0.042)
$Control_{t-1}$	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Firm Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Observations	693,782	693,966	689,685	693,774	692,560	692,874
Wald F-stat	52.15	51.31	51.22	52.11	52.58	52.39

Panel B: SOEs

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable	LogAsset	LogWorker	LogDebt	ROA	Log(Sales/Worker)	LogSales
Log(Loan_PI)	0.196***	0.187***	0.304***	-0.001	0.033*	0.181***
	(0.017)	(0.016)	(0.024)	(0.004)	(0.019)	(0.020)
$Control_{t-1}$	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Firm Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Observations	230,336	229,774	228,127	230,335	222,680	225,486
Wald F-stat	88.78	91.84	87.17	88.23	84.03	81.87

Note. The table shows the two stage least squares regression results by using *Firsth* to *Sixth* as instrumental variable for logarithm of CDB province level outstanding loan amount in 41 manufacturing industries and 27 provinces (exclude Beijing, Shanghai, Tianjing, and Chonqing). In Panel A, data is restricted to private firms in CIC data from 1998 to 2009. In Panel B, data is restricted to SOEs in CIC data from 1998 to 2009. *Loan_PI* is the outstanding loan amount at province × industry × year level. $Control_{t-1}$ include provincial level GDP, income per capita, fiscal income and total employment in the previous years. All columns are controlled by year fixed effect and firm fixed effect. Standard errors are clustered at firm level. Cragg-Donald Wald F-statistics for weak identification tests are reported.

Table 8
Upstream Industry Loan's Effect on Firms in Downstream Industry (2SLS)

Panel A: Private Firms						
	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable	LogAsset	LogWorker	LogDebt	ROA	Log(Sales/Worker)	LogSales
Log(Upstream_Loan)	0.092***	0.007	0.046***	-0.001	0.064***	0.071***
	(0.011)	(0.009)	(0.015)	(0.003)	(0.012)	(0.012)
$Control_{t-1}$	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Firm Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Observations	804,718	804,853	799,002	804,709	803,296	803,712
Wald F-stat	581.3	581.3	569.9	580.0	580.2	579.0
Panel B: Private Firms						
	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable	LogAsset	LogWorker	LogDebt	ROA	Log(Sales/Worker)	LogSales
Log(Upstream_Loan)	0.091***	0.006	0.045***	-0.000	0.066***	0.072***
	(0.011)	(0.009)	(0.015)	(0.003)	(0.011)	(0.012)
Log(Upstream_Loan)	0.073***	0.067***	0.120***	-0.026***	-0.050***	0.016
*Connected	(0.019)	(0.013)	(0.024)	(0.003)	(0.014)	(0.019)
$Control_{t-1}$	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Firm Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Observations	804,718	804,853	799,002	804,709	803,296	803,712
Wald F-stat	1451	1459	1431	1456	1457	1454
Panel C: SOEs						
	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable	LogAsset	LogWorker	LogDebt	ROA	Log(Sales/Worker)	LogSales
Log(Upstream_Loan)	0.122***	0.125***	0.191***	-0.009***	-0.033**	0.084***
	(0.012)	(0.011)	(0.017)	(0.003)	(0.014)	(0.015)
$Control_{t-1}$	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Firm Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Observations	285,544	283,980	282,245	285,544	275,484	279,226
Wald F-stat	620.1	607.8	602.5	617.9	577.8	590.6

Note. The table shows the two stage least squares regression results by using *First* to *Sixth* as instrumental variable for logarithm of CDB province level outstanding loan amount in 25 manufacturing industries (collapsed from 41 CIC manufacturing industries) and 27 provinces (exclude Beijing, Shanghai, Tianjing, and Chonqing). In Panel A and B, data is restricted to private firms in CIC data from 1998 to 2009. Panel C is for SOEs. *Upstream_Loan* is the loan amount in firm's most related upstream industry at province × industry × year level. *Connected* is the dummy for whether the private firm's political hierarchy is above the city(province level and national level) or not. $Control_{t-1}$ include provincial level GDP, income per capita, fiscal income and total employment in the previous years. All columns are controlled by year fixed effect and firm fixed effect. Standard errors are clustered at firm level. Cragg-Donald Wald F-statistics for weak identification tests are reported.

Appendix

Table A1
Variables' Definition and Construction

Loan_City	Outstanding total CDB city level loan amount.
Issuance_City	Total CDB new city level loan issuance amount.
Loan_INF_City	Outstanding CDB city level loan amount for infrastructure projects.
Issuance_INF_City	Total CDB city level loan issuance amount for infrastructure projects.
Loan_IND_City	Outstanding CDB city level loan amount for industry firms.
Issuance_IND_City	Total CDB city level loan issuance amount for industry firms.
Loan_PI	Outstanding total CDB province industry level loan amount.
Issuance_PI	Total CDB province industry level loan new issuance amount.
GDP	City level GDP level amount.
AvgIncome	Income per capita in the city.
FiscalIncome	City fiscal income amount.
Employment	City total number of workers.
PoliticianYear	Number of years that the city secretary has been staying in the city.
Age	The age of the city secretary.
Gender	Dummy for whether the city secretary is a female or not.
Relation	Dummy for whether the city secretary is born at the same city as the province governors.
Promotion	Dummy for whether the city secretary is promoted to a higher position in the government or not in the end of her term. In China, different cities have different political hierarchy. For example, Shanghai, Beijing, chonqing, and Tianjing are in the ministry level (same level as province).
LogAsset	Logarithm of the total asset of the firm.
LogWorker	Logarithm of the employee number of the firm.
LogDebt	Logarithm of the total debt of the firm.
ROA	Contemporaneous ROA. It is calculated by dividing a firm's annual earnings by its total asset in the same year.
Log(Sales/Worker)	Logarithm of the sales per employee.
LogSales	Logarithm of the total sales.
Tax_Corp	The corporate tax rate of each firm by dividing corporate tax payable amount by the income before tax every year. Tax_Corp is a missing value when income before tax is negative.
Tax_VAT	The value-added tax rate of each by dividing value-added tax payable amount by the production value-added every year. Tax_VAT is a missing value when production value-added is negative. It covers all 554,882 firms in CIC data in 1998, 1999, 2000, 2003, 2005, 2006 and 2007. CIC data doesn't record the value-added tax payment in 2001, 2002, 2004, 2008 and 2009.

Note. $Loan\_City$, $Issuance\_City$, $Loan\_INF_City$, $Issuance\_INF\_City$, $Loan\_IND\_City$, $Issuance\_IND\_City$ are from the CDB city level data from 1998 to 2010. It covers 310 cities in China. $Loan\_PI$ and $Issuance\_PI$ are from CDB province level data from 1998 to 2013. It covers 95 industries across all 31 provinces in China. The unit is 100 million RMB. GDP, $AvgIncome$, $FiscalIncome$, and $Employment$ are from National Bureau of Statistics of China. It covers covers 310 cities in China from 1998 to 2010. The unit is 100 million RMB for GDP, $AvgIncome$, and $FiscalIncome$. It is 100 thousand for $Employment$. $PoliticianYear$, Age, $Gender$, $Relation$, $Promotion$ are from the politician profile dataset. It covers covers 310 cities in China from 1998 to 2010. $LogAsset$, $LogWorker$, $LogDebt$, ROA, $Log(Sales/Worker)$, $LogSales$, Tax_Corp, and Tax_VAT are from the Chinese Industry Census data. It covers all 711,892 firms from 1998 to 2009. The unit of asset, debt, sales is in thousand RMB.

Table A2
City Secretary's Turnover and Borrowing from CDB(off national cycle cities)

Panel A	Total Loan		Loan for Infrastructure		Loan for Industry Firms	
	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable	Log(Loan_City)	Log(Issuance_City)	Log(Loan_City)	Log(Issuance_City)	Log(Loan_City)	Log(Issuance_City)
PoliticianYear	-0.078**	-0.190***	-0.124***	-0.161***	-0.099**	-0.242***
	(0.031)	(0.023)	(0.017)	(0.032)	(0.041)	(0.033)
$Control_{t-1}$	Yes	Yes	Yes	Yes	Yes	Yes
Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,686	1,542	1,387	1,278	1,495	1,293
R-squared	0.809	0.639	0.855	0.553	0.706	0.514
Panel B	Total Loan		Loan for Infrastructure		Loan for Industry Firms	
	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable	Log(Loan_City)	Log(Issuance_City)	Log(Loan_City)	Log(Issuance_City)	Log(Loan_City)	Log(Issuance_City)
Year_2	-0.086*	-0.174**	-0.119***	-0.161*	-0.043	-0.257**
	(0.047)	(0.073)	(0.042)	(0.095)	(0.063)	(0.111)
Year_3	-0.137**	-0.350***	-0.228***	-0.261***	-0.179**	-0.472***
	(0.063)	(0.067)	(0.045)	(0.083)	(0.083)	(0.097)
Year_4	-0.181**	-0.527***	-0.358***	-0.537***	-0.207*	-0.644***
	(0.091)	(0.085)	(0.055)	(0.114)	(0.119)	(0.130)
Year_5	-0.314**	-0.891***	-0.487***	-0.624***	-0.415*	-1.229***
	(0.154)	(0.181)	(0.095)	(0.201)	(0.217)	(0.242)
Year_6	-0.579***	-1.050***	-0.728***	-0.791***	-0.611**	-1.316***
	(0.195)	(0.194)	(0.133)	(0.279)	(0.278)	(0.231)
$Control_{t-1}$	Yes	Yes	Yes	Yes	Yes	Yes
Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,686	1,542	1,387	1,278	1,495	1,293
R-squared	0.810	0.640	0.856	0.554	0.707	0.517

Note. Data restricted to CDB city level loan from 1998 to 2010. I exclude the city secretaries whose turnover are at the same time as the national turnover cycle(year 1998, 2003 and 2008). The remaining observations are for the cities with different turnover cycles than the national cycle. The regression settings are the same as Table 4. All columns are controlled by year fixed effect, city fixed effect and politician personal fixed effect. Standard errors are clustered at city level.

Table A3
City Secretary's Promotion and GDP Performance

	(1)	(2)	(3)	(4)	(5)
Dependent Variable	Promotion	Promotion	Promotion	Promotion	Promotion
Log(Loan Increase in 1st year)	0.102***				
	(0.035)				
Log(Loan Increase in 1st-2nd year)		0.087**			
		(0.034)			
Log(Loan Increase in 1st-3rd year)			0.055*		
			(0.033)		
Log(Loan Increase in 1st-4th year)				0.062*	
				(0.032)	
Log(Loan Increase in 1st-5th year)					0.057*
					(0.033)
Relation	0.430*	0.457**	0.431**	0.394*	0.426**
	(0.237)	(0.218)	(0.211)	(0.207)	(0.205)
Age	-0.084***	-0.078***	-0.074***	-0.074***	-0.074***
	(0.013)	(0.013)	(0.012)	(0.012)	(0.012)
Gender	0.617	0.663*	0.477	0.410	0.407
	(0.388)	(0.388)	(0.364)	(0.381)	(0.381)
Observations	691	758	792	810	812
Chi squared	54.58	48.75	42.96	43.85	43.70

Note. Table shows the results from Probit regression with CDB loan on city secretaries' promotion.*Promition* is the dummy for whether the city secretary is promoted or not at the end of the term. GDPLog(Loan Increase in 1st year) is the logarithm of CDB outstanding loan amount increase in the first year of the city secretary's tenure. Log(Loan Increase in 1st-2nd year) is the logarithm of CDB outstanding loan amount increase in the first two years of the city secretary's tenure. *Age* is the age of the city secretary in the end of the term. Standard errors are clustered at city level.

Table A4
Politician's Other Channels to Affect Local Economy

Panel A: Current Turnover

	(1)	(2)	(3)	(4)	(5)
Dependent Variable	Developed_Land	Export	Fiscal_Income	Tax_Corp	Tax_VAT
PoliticianYear	0.034	-2.481	1.701	-0.072	0.043
	(0.022)	(2.279)	(1.387)	(0.062)	(0.101)
Control_{t-1}	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes
City Fixed Effect	Yes	Yes	Yes	Yes	Yes
Politician Fixed Effect	Yes	Yes	Yes	Yes	Yes
Observations	3,376	3,557	3,562	3,234	1,856
R-squared	0.236	0.412	0.968	0.507	0.690

Panel B: Lagged Turnover

	(1)	(2)	(3)	(4)	(5)
Dependent Variable	Developed_Land	Export	Fiscal_Income	Tax_Corp	Tax_VAT
$\text{PoliticianYear}_{t-1}$	0.004	-0.153	-0.160	-0.072	0.045
	(0.003)	(0.330)	(0.146)	(0.059)	(0.098)
Control_{t-1}	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes
City Fixed Effect	Yes	Yes	Yes	Yes	Yes
Politician Fixed Effect	Yes	Yes	Yes	Yes	Yes
Observations	3,092	3,255	3,259	2,934	1,589
R-squared	0.222	0.400	0.966	0.535	0.733

Note. This table repeats the first state regressions. Data restricted to 310 cites from 1998 to 2010. In column 1, *Developed_Land* is the total developed land in each city every year. In column 2, *Export* is the total export amount in each city every year. In column 3, *Fiscal_Income* is the total fiscal income amount in each city every year. In column 4, *Tax_Corp* is the average manufacturing firm effective corporate tax rate in each city every year.In column 5, Tax_VAT is the average manufacturing firm effective value-added tax rate in each city every year. This table mainly explore the other channels that city secretary turnover can influence the local economy. Panel A is for current turnover $PoliticianYear$ and Panel B is for the lagged turnover $PoliticianYearLag$. Control_{t-1} include city level GDP, income per capita, fiscal income and total employment in the previous years. All columns are controlled by year fixed effect, city fixed effect and politician personal fixed effect. Standard errors are clustered at city level.

Table A5
Turnover Timing's Effects on SOEs under Different CDB Loan Amount Level

Panel A: All Cities

	(1)	(2)	(3)	(4)	(5)
Dependent Variable	LogAsset	LogFixedAst	LogWorker	LogDebt	Log(Sales/Worker)
PoliticianYear	-0.007	-0.013	0.000	-0.018*	0.014*
	(0.007)	(0.009)	(0.006)	(0.010)	(0.008)
PoliticianYear*HighCDB	-0.013***	-0.010***	-0.012***	-0.007**	-0.010***
	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)
HighCDB	0.025***	0.023**	0.055***	0.006	0.013
	(0.009)	(0.011)	(0.009)	(0.012)	(0.012)
Control_{t-1}	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes
Firm Fixed Effect	Yes	Yes	Yes	Yes	Yes
Politician Fixed Effect	Yes	Yes	Yes	Yes	Yes
Observations	382,317	379,632	381,720	378,567	369,479
R-squared	0.108	0.0523	0.0643	0.0647	0.178

Panel B: Cities with Zero CDB Loan

	(1)	(2)	(3)	(4)	(5)
Dependent Variable	LogAsset	LogFixedAst	LogWorker	LogDebt	Log(Sales/Worker)
PoliticianYear	-0.073	0.003	-0.182	-0.025	0.130
	(0.157)	(0.220)	(0.142)	(0.230)	(0.210)
Control_{t-1}	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes
Firm Fixed Effect	Yes	Yes	Yes	Yes	Yes
Politician Fixed Effect	Yes	Yes	Yes	Yes	Yes
Observations	78,512	77,919	78,261	77,643	75,212
R-squared	0.0391	0.0237	0.0635	0.0305	0.0534

Note. Panel A is restricted to SOEs in CIC data from 1998 to 2009. $PoliticianYear$ is the number of years that the secretary has been staying in the city. $HighCDB$ is the dummy for whether the city's CDB loan amount is above the median of all CDB loan in 310 cities from 1998 to 2009. GDP, $AvgIncome$, $FiscalIncome$ and $Employment$ are city level GDP, income per capita, fiscal income and total employment respectively. All columns are controlled by year fixed effect, firm fixed effect and politician personal fixed effect. Standard errors are clustered at firm level.
Panel B is restricted to SOEs in CIC data from 1998 to 2009 with 0 CDB loan amount in the city. $PoliticianYear$ is the number of years that the secretary has been staying in the city. Control_{t-1} include city level GDP, income per capita, fiscal income and total employment in the previous years. All columns are controlled by year fixed effect, firm fixed effect and politician personal fixed effect. Standard errors are clustered at firm level.

Table A6
CDB Province Industry Level Loan and City Secretary Turnover (First Stage)

	(1)	(2)	(3)
Dependent Variable	Log(Loan_PI)	Log(Loan_PI)	Log(Loan_PI)
First	0.268***		
	(0.090)		
Second	0.366***		
	(0.099)		
Third	0.251***		
	(0.086)		
Fourth	0.128		
	(0.082)		
Fifth	0.057		
	(0.140)		
Sixth	-0.097		
	(0.120)		
First-Second		0.339***	
		(0.103)	
First-Third			0.332***
			(0.099)
$Control_{t-1}$	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes
Province Fixed Effect	Yes	Yes	Yes
Industry Fixed Effect	Yes	Yes	Yes
Observations	4,197	4,197	4,197
R-squared	0.538	0.535	0.536

Note. The regressions are estimated at province× industry × year level. Data restricted to CDB province level industry loan data from 1998 to 2009 in 31 provinces and 41 manufacturing industries. $Log(Loan\_PI)$ is logarithm of the outstanding loan amount at province-industry level every year. $First$ is the dummy for whether the city secretary is in the first year of the term and the firm is in the city's largest SOE industry. $Second$ is the dummy for whether the city secretary is in the second year of the term and the firm is in the city's largest SOE industry. The dummies from $Third$ to $Sixth$ are defined in the same way. $Control_{t-1}$ include city level GDP, income per capita, fiscal income and total employment in the previous years. All columns are controlled by year fixed effect, province fixed effect and industry fixed effect. Standard errors are clustered at province level.

Figure 1: CDB Outstanding Loan Amount and New Issuance

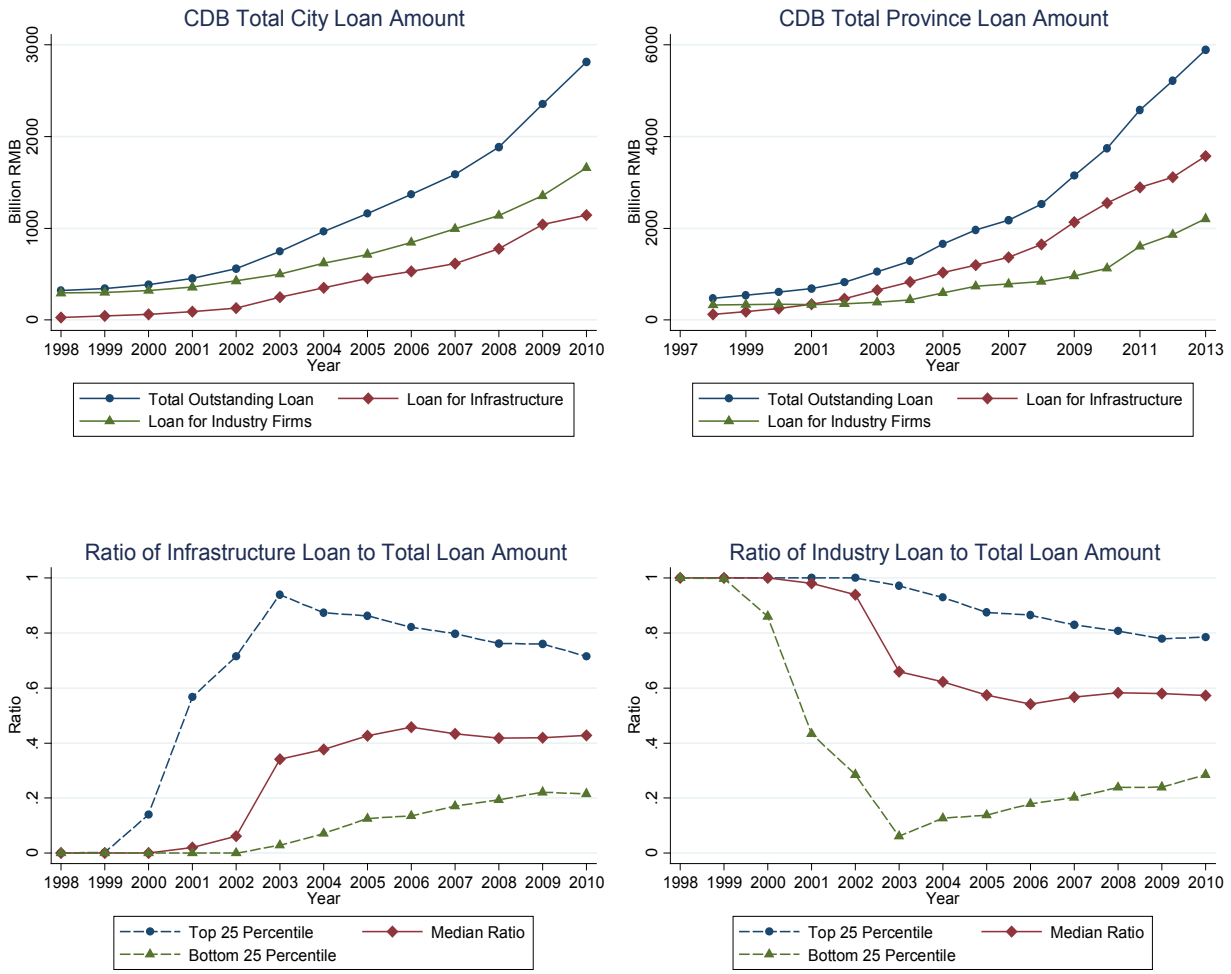

Figure 1 includes the plots of CDB outstanding loan amount. The loans can be separated into infrastructure loan and the loan for industry firms. Infrastructure includes transportation(e.g. road, railway, airport, bridge, tunnel), water supply, energy supply(e.g. gas,electric), telecommunication and public service(e.g. Sewage discharge) The top two panels are the loans at city and province level. City level loan doesn't include the province level projects even though part of the project is located in the city such as high way. The unit is billion RMB. The bottom 2 panels are ratios of infrastructure loan and industry loan to the total city level loan amount respectively. The solid lines are median ratio among 310 cities and dash lines are top and bottom quartile of ratios among 310 cities each year.

Figure 2: Political Turnover in China

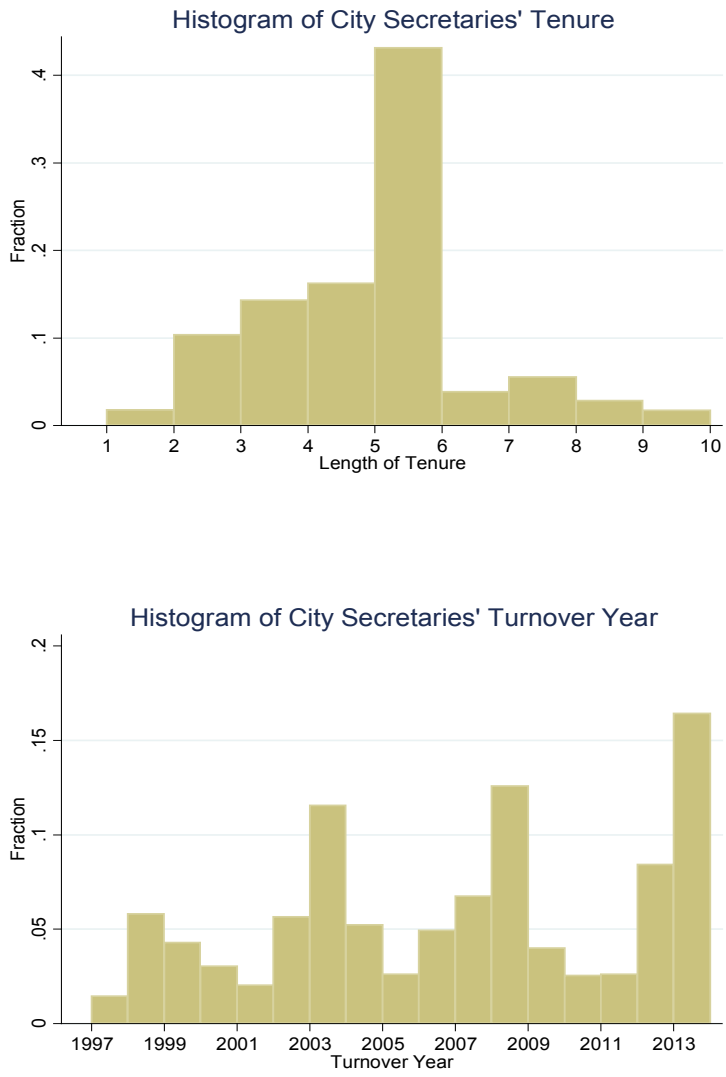

Figure 2 includes the plots of city level political turnover in China. It is at city and politician level. The data covers 334 cities and 1,227 city secretaries from 1997 to 2013. The top panel is the histogram of city secretaries term length. I round the monthly turnover data into year frequency by using June as the cutoff. 43% of the city secretaries leave the city in their fifth year. The bottom panel is the histogram of the turnover year of the city secretaries.

Figure 3: Local Government Borrowing

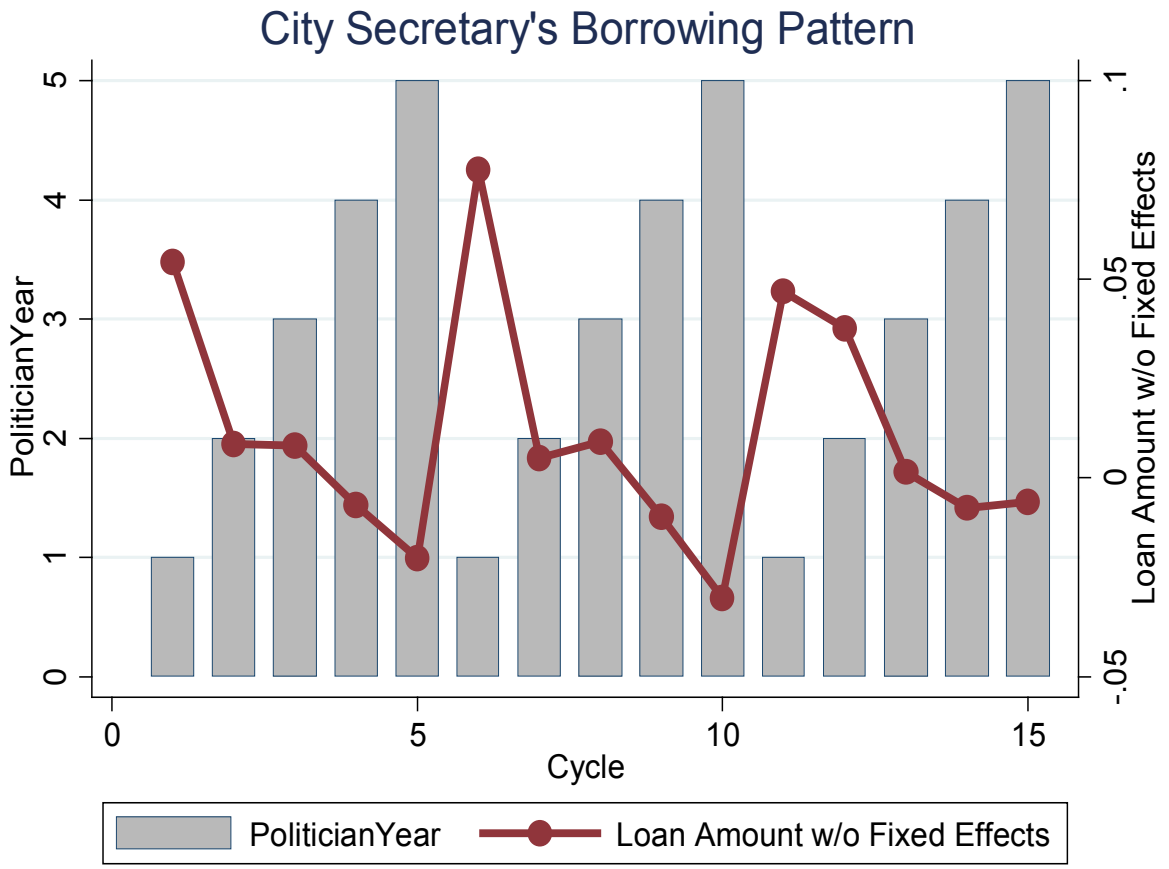

Figure 3 is the plots of logarithm of CDB city total loan amounts after taking out the year fixed effects, city fixed effects and politician fixed effects. The horizontal axis is the cycle of city secretary turnover. There are 3 cycles in total and every cycle has 5 years. From 1998 to 2010, there are 3 national turnover cycles: 1997 to 2002, 2003 to 2007, and 2007 to 2012. The left vertical axis $PolitianYear$ is the number of years that city secretary has been staying in the city, which is from 1 to 5 years. For example, the first cycle (1 to 5 on horizontal axis) is from 1998 to 2002. I cluster the cities by $PolitianYear$(1 to 5 years) from 1998 to 2002 and plot the average CDB city loan amounts for each bin of $PolitianYear$. I do the same thing for the second cycle from 2003 to 2007 which is from 6 to 10 in the horizontal line. For the third cycle is from 2008 to 2010 which is from 11 to 15 in the horizontal line.

Figure 4: Shifts of CDB Industry Loan Over Time

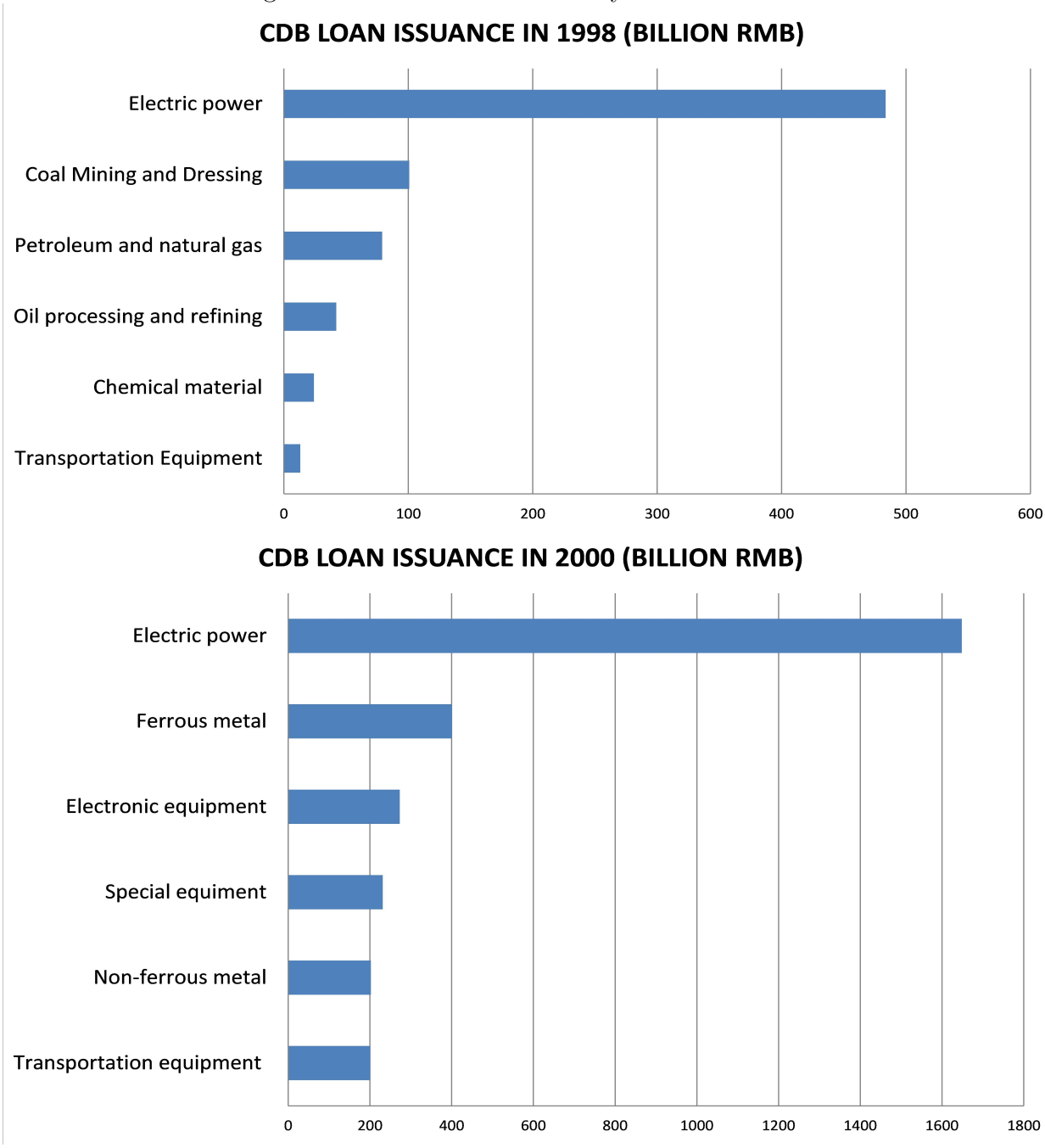

Figure 4 are plots of top 6 industries which have the biggest loan issuance from CDB. Data is restricted to CDB province level industry loan data. There are 41 manufacturing industries in total among 31 provinces in China. The top penal shows the CDB's biggest 6 industries in 1998. The amount of each industry is the sum of all CDB loan issuance amounts from all 31 provinces in China. The bottom penal shows the CDB's biggest 6 industries in 2010. The amount of each industry is the sum of all CDB loan issuance amounts from all 31 provinces in China. The unit is billion RMB.