Online Appendix for

Government Credit and International Trade

Contents

1 Additional Background of China's Banking System

There are four types of banks in China's banking system. For commercial banks, they are classified into three groups: 1) big five state-controlled commercial banks, which are nationwide banks and control for approximately 45% of China's banking market shares (ICBC, ABC, BOC, CCB, and BoCom); 2) 12 joint-equity banks, which are also mainly state-owned nationwide banks with a focus on local businesses and control for approximately 17% of the market share; 3) 131 municipal commercial banks, which mainly focus on the businesses in their cities. The fourth type is policy banks, and there are three of them in China.

In particular, besides the CDB, there are two other policy banks in China: the Agricultural Development Bank of China (ADBC) and the Export-Import Bank of China (EXIM). The ADBC mainly lends to agricultural-related activities and focuses on rural areas. For the EXIM, compared with the CDB, there are two reasons why this paper focuses on CDB credit. First, we mainly investigate the spillover effects of government-subsidized credit across the supply chain. The CDB mainly supports basic and strategic industries at the top of the supply chain, which has substantial impacts on downstream manufacturing industries. By contrast, the EXIM bank targets specific firms in high-tech-intensive and high-value-added industries, such as mechanical and electronic products, which are typically at the bottom of the supply chain. In other words, the CDB and EXIM lend to different areas, and they complement each other. Hence, using CDB credit serves the main research question in this paper. Second, the size of the CDB is much larger than the EXIM bank, so the CDB has stronger and broader impacts on the Chinese domestic market. In 2013, the total assets for the CDB were RMB 8.18 trillion, while the number for the EXIM bank was RMB 1.89 trillion. Moreover, EXIM issues a significant amount of loans to foreign firms. The outstanding amount for EXIM's export seller's credit was RMB 399.56 billion (only 27.5% of the

total EXIM loan amount), while the outstanding industrial loan amount for CDB was more than RMB 2 trillion. Furthermore, compared to EXIM credit, CDB credit is subsidized even more. For example, both the CDB and EXIM raise funds by issuing bonds, and the interest rates for CDB bonds are approximately 10-30 basis points lower than the EXIM bonds since CDB bonds enjoy the central government explicit guarantees that make the CDB bonds the same as treasury regarding credit risk and interest rate.[1]

[1] Professional rating agencies, including Moody's and Standard & Poor's, have retained CDB's rating at the same level as China's sovereign rating for many consecutive years (http://www.cdb.com.cn/English/gykh_512/khjj/). See also, http://politics.people.com.cn/n/2015/0619/c70731-27180232.html for a detailed report for CDB's explicit guarantees from central government. The data on bond yields can be found in the WIND database or China Central Depository & Clearing Co., Ltd. http://www.ccdc.com.cn/.

Figure A1: Top Five Industries with Largest CDB Loans

This figure shows the top five industries with the largest CDB outstanding loans in our sample for 2002. The amount for each industry is the sum of all CDB outstanding loan amounts across the 31 provinces in China. The unit is in billions RMB.

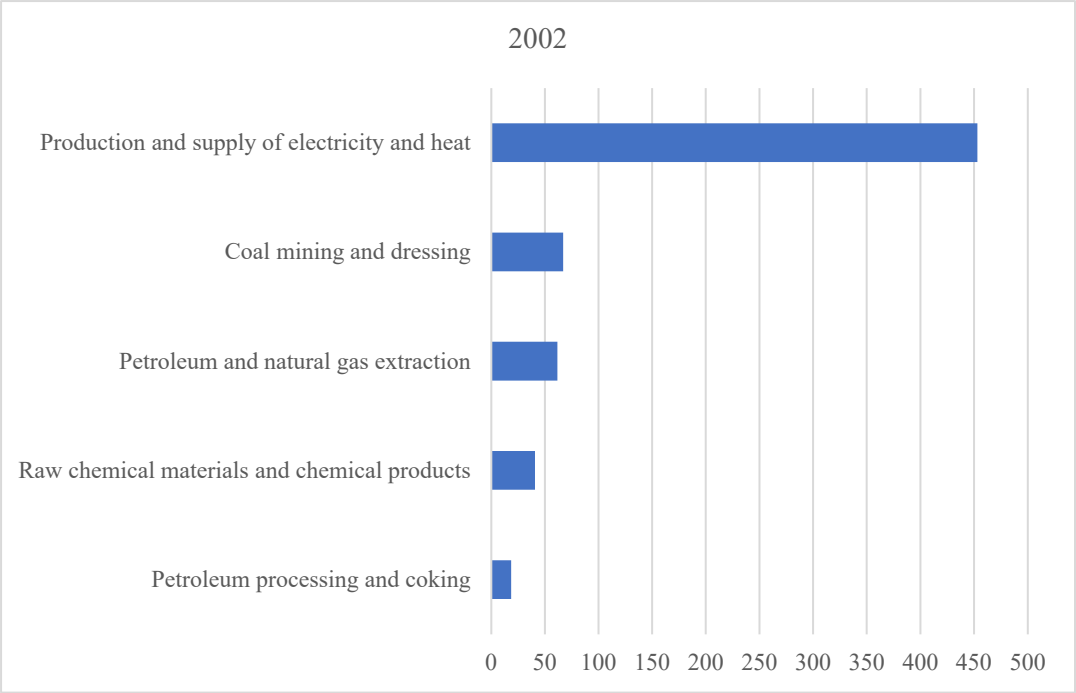


Figure A2: Export Amount by Firm Type

This figure shows the time trend of total export amounts for SOEs and private firms from 2000 to 2013. It is based on the sample containing only manufacturing firms (i.e., excluding trade intermediaries) in the China Customs data. SOEs denote firms that are state-owned enterprises or collectively-owned firms. Private denotes private firms. The unit is in billion RMB.

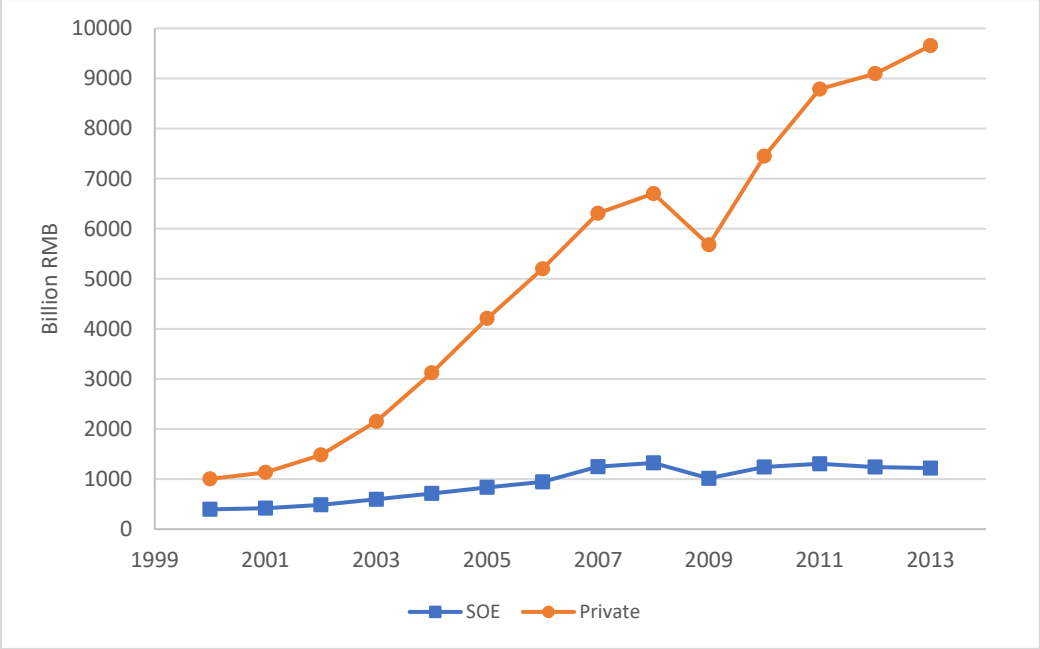
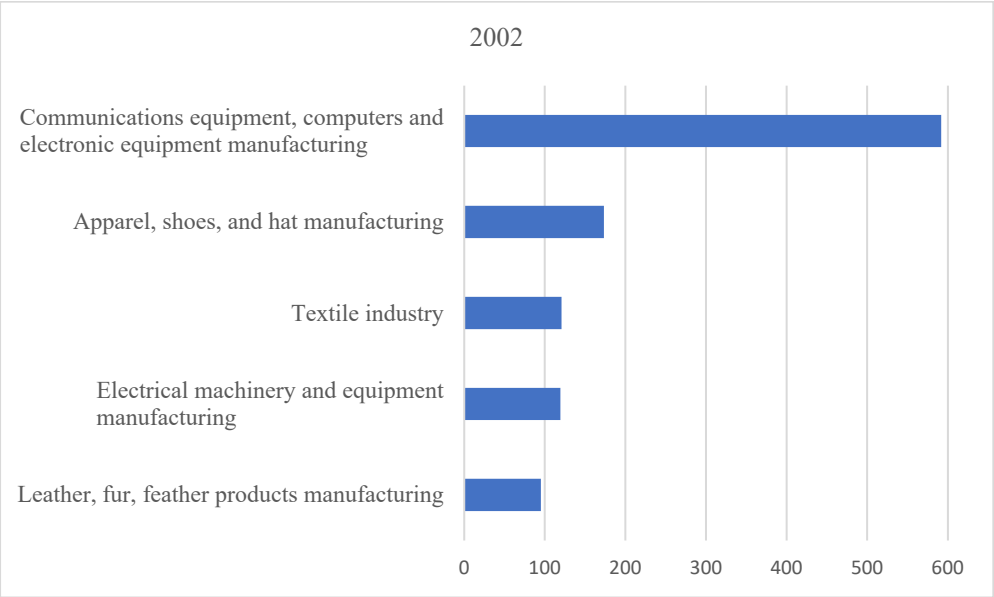


Figure A3: Top Five Export Industries

This figure shows the top five export industries ranked by export amounts for 2002 and 2013, respectively. The sample includes only manufacturing firms (i.e., excluding trade intermediaries) in the China Customs data from 2000 to 2013. The industry is at the two-digit CDB industry classification level, which is comparable with the U.S. two-digit SIC code. The top panel shows the largest five industries ranked by export amounts and the associated export amounts for 2002, while the bottom panel is for 2013. The unit is in billion RMB.



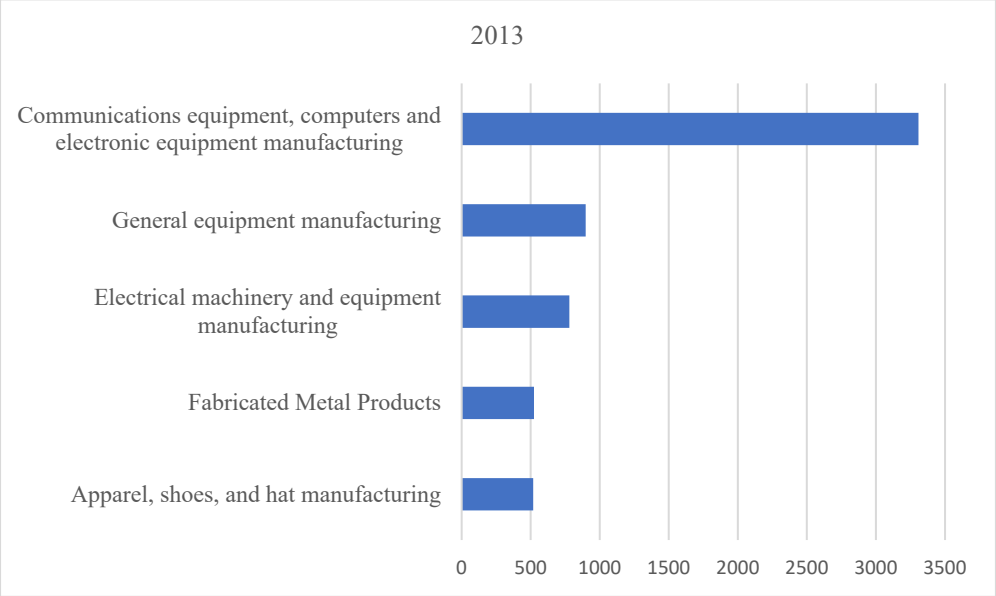


Figure A4: Top Ten Export Destination Countries

This figure shows the largest ten destination countries/territories ranked by total export amounts of Chinese firms from 2000 to 2013. Based on the population data of China Customs, we aggregate the export amount from all export transactions (i.e., exports by manufacturing firms and exports by intermediary firms) from 2000 to 2013 by destination countries and plot the total export amount for the top ten countries/territories (Hong Kong SAR is excluded). The unit is in trillion RMB.

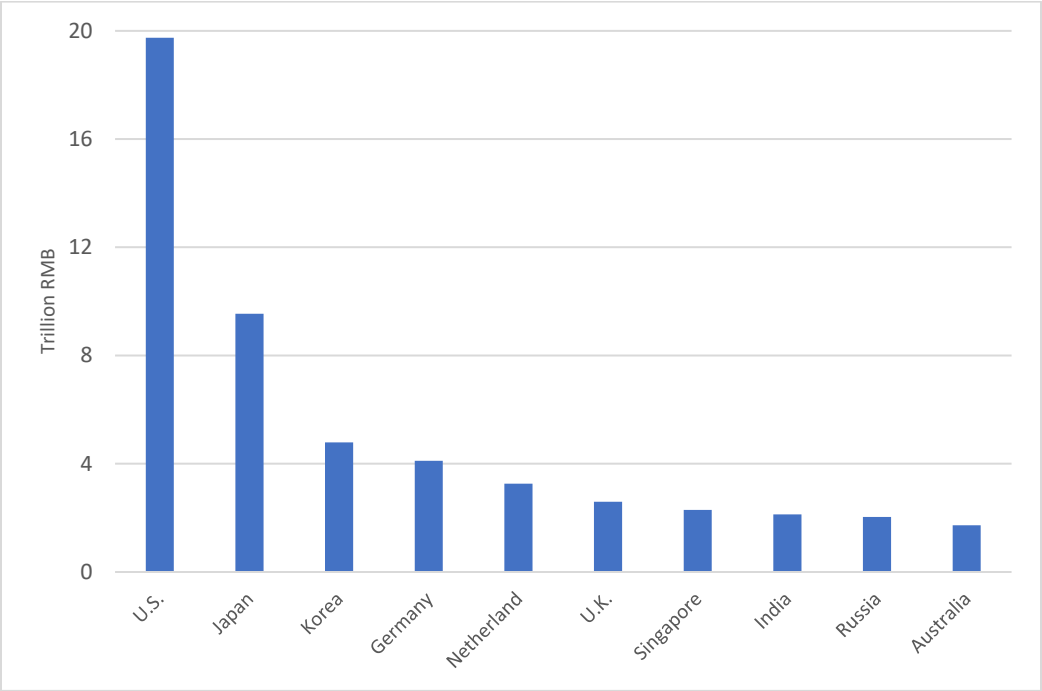


Figure A5: Export Amount by Type of Goods

This figure shows the time trend of export amounts for two types of exported goods: consumer goods and non-consumer goods. Based on the population data of China Customs, we aggregate the export amount from all export transactions (i.e., exports by manufacturing firms and exports by intermediary firms) from 2000 to 2013. Exported goods are classified as either raw materials, intermediate goods, capital goods, or consumer goods using the concordance table from HS standard product groups (UNCTAD-SoP), which is available at https://wits.worldbank.org/referencedata.html. We classify the first three types of goods into non-consumer goods group, and consumer goods are classified into consumer goods group. We plot the time trend of export amounts for the two groups. The unit is in billion RMB.

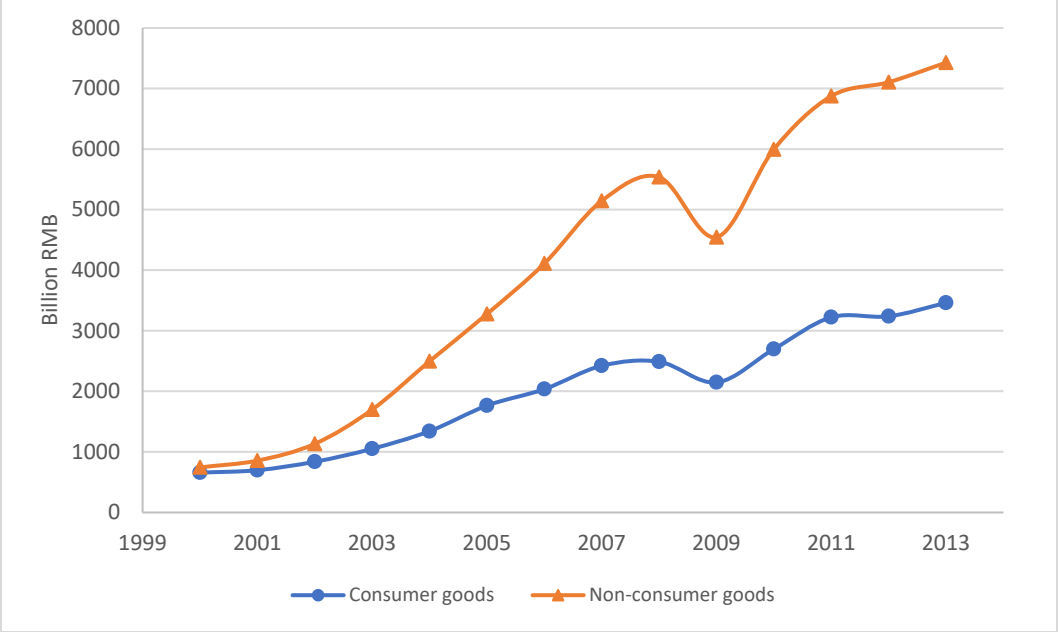


Table A1: Robustness Tests of CDB Loans' Impacts on Export

This table reports the regression results of robustness checks for the effects of CDB loans on export activities using the firms in downstream industries. In Panel A, we construct an alternative upstream loan measure, *LogWTUpstreamLoan,* by calculating the logarithm of the weighted average upstream loan amounts (excluding itself) across industries. In Panel B, we aggregate upstream CDB loans across provinces to the national-industry-year level. In Panel C, we repeat the analysis presented in Panel C of Table 2 for a subsample of firms matched with CIC data to obtain the firm-year level control variables. Control variables include the logarithm of a firm's total asset, the logarithm of firm sales, the logarithm of provincial GDP and population. See the Appendix Table for detailed variable definitions. Firm fixed effects and province×year fixed effects are included. Standard errors are clustered at the firm level, and *t*-statistics are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	1	2	3	4
Dep. Var.	*LogExport*	*LogNumDestinations*	*LogNumProducts*	*LogNumDestProducts*
Panel A: Weighted Average Upstream Loan				
LogDirectLoan	0.0004	0.0007***	0.0004***	0.0005***
	(1.47)	(5.16)	(3.02)	(3.00)
LogWTUpstreamLoan	0.1161***	0.0365***	0.0520***	0.0578***
	(17.06)	(11.71)	(16.46)	(14.88)
Firm FE	Yes	Yes	Yes	Yes
Province×Year FE	Yes	Yes	Yes	Yes
Observations	1,451,799	1,451,801	1,451,801	1,451,801
Adjusted R^2	0.692	0.741	0.716	0.724
Panel B: CDB Loans at Industry Level				
LogDirectLoan	0.0002	0.0006***	0.0003*	0.0003**
	(0.71)	(4.42)	(1.96)	(2.06)
LogAllUpstreamLoan	0.0895***	0.0405***	0.0527***	0.0604***
	(25.41)	(23.10)	(34.08)	(29.55)
Firm FE	Yes	Yes	Yes	Yes
Province×Year FE	Yes	Yes	Yes	Yes
Observations	1,451,799	1,451,801	1,451,801	1,451,801
Adjusted R^2	0.692	0.741	0.717	0.725
Panel C: With Controls				
LogDirectLoan	0.0012***	0.0010***	0.0005***	0.0007***
	(3.32)	(5.41)	(2.97)	(3.43)
LogUpstreamLoan	0.0019***	0.0014***	0.0023***	0.0020***
	(5.01)	(6.91)	(12.92)	(8.83)
Controls	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Province×Year FE	Yes	Yes	Yes	Yes
Observations	655,452	655,452	655,452	655,452
Adjusted R^2	0.761	0.791	0.726	0.778

Table A2: Additional Robustness Tests at the Aggregate Level

This table reports the regression results for the effects of CDB loans on export activities at the province-industry-year level. Panel A shows the OLS regression results, and Panel B shows the corresponding 2SLS regression results. The dependent variables in this table are measured and aggregated at the province-industry-year level: the logarithm of export amount (*LogExport*), number of export destinations (*LogNumDestinations*), number of export product varieties (*LogNumProducts*), and number of export destination-product pairs (*LogNumDestProducts*). *LogNumFirms* is the logarithm of the number of firms that export in a given province and industry for each year. *LogDirectLoan* denotes the logarithm of direct CDB loan amount to a given province and industry. *LogUpstreamLoan* denotes the logarithm of upstream CDB loan amount to the upstream industry. Industry fixed effects and province×year fixed effects are included. Standard errors are clustered at the province×industry level for all regressions, and *t*-statistics are reported in parentheses. Kleibergen-Paap (KP) Wald *F*-statistics for weak identification tests are reported in Panel B. *, **, and *** indicate the statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Province-Industry Level Regressions (OLS)

	1	2	3	4	5
Dep. Var.	*LogExport*	*LogNumDestinations*	*LogNumProducts*	*LogNumDestProducts*	*LogNumFirms*
LogDirectLoan	0.0242***	0.0058***	0.0020**	0.0105***	0.0124***
	(5.33)	(3.81)	(2.55)	(5.93)	(7.49)
LogUpstreamLoan	0.0192***	0.0037***	0.0010	0.0076***	0.0085***
	(4.68)	(2.74)	(1.42)	(4.81)	(5.65)
Industry FE	Yes	Yes	Yes	Yes	Yes
Province×Year FE	Yes	Yes	Yes	Yes	Yes
Observations	10,790	10,790	10,790	10,790	10,790
Adjusted R^2	0.758	0.840	0.904	0.898	0.908

Panel B: Province-Industry Level Regressions (2SLS)

	1	2	3	4	5
Dep. Var.	*LogExport*	*LogNumDestinations*	*LogNumProducts*	*LogNumDestProducts*	*LogNumFirms*
LogDirectLoan	0.0095	0.0027	0.0028**	0.0072**	0.0071**
	(1.26)	(1.08)	(2.33)	(2.33)	(2.15)
LogUpstreamLoan	0.1776**	0.0299	-0.0112	0.0428	0.0709**
	(2.45)	(1.29)	(-1.07)	(1.58)	(2.47)
Industry FE	Yes	Yes	Yes	Yes	Yes
Province×Year FE	Yes	Yes	Yes	Yes	Yes
Observations	8,655	8,655	8,655	8,655	8,655
KP Wald F-stat	15.55	15.55	15.55	15.55	15.55

Table A3: Exclusion Conditions (Using Predicted Turnover)

This table reports the regression results for exclusion conditions using predicted political turnover cycles. Panel A shows the relationship between the instrument, *First3,* and CDB loans and several other potential channels at the province-industry-year level. Specifically, column (1) shows the first-stage results of regressing CDB provincial industry loan amounts on *First*3. *LogProvLoan* is the logarithm of annual province-industry outstanding CDB loans. *First3* is a dummy variable for whether a city secretary is in the predicted first three years of his/her term and where the city's largest SOE industry (i.e., focal industry) is in the same industry as that of provincial industry loans. Industry fixed effects and province×year fixed effects are included, and standard errors are clustered at the province level. Panel B regresses CDB city loans on the predicted city secretary's turnover cycle and shows the regression results of alternative channels for predicted political turnover at the city-year level. *LogCityLoan* is the logarithm of CDB total loans outstanding at the city-year level. *Year1-3* is a dummy variable that equals one if a city secretary is in the predicted first three years of his/her term. Control variables include city-level GDP, population, urban income, and the number of workers. City, year, and politician fixed effects are included, and standard errors are clustered at the city level. See the Appendix Table for detailed variable definitions. *t*-statistics are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Province-Industry Level

	1	2	3	4	5	6
	CDB Loan	Other Potential Channels				
Dep. Var.	*LogProvLoan*	*OverallTax*	*IncomeTax*	*VAT*	*Subsidy*	*ForeignCap*
First3	0.5005***	0.0009	0.0003	-0.0002	-0.0003	-0.0008
	(3.93)	(0.77)	(0.18)	(-0.29)	(-0.88)	(-0.53)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Province×Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5,573	5,573	5,573	5,573	5,573	5,573
Adjusted R^2	0.335	0.563	0.747	0.772	0.091	0.314

Panel B: City Level

	1	2	3	4	5
	Other Potential Channels				
Dep. Var.	*LogFiscalInc*	*LogFiscalExp*	*LogLand*	*LogBankLoan*	*LogTransfer*
Year1-3	-0.0133	0.0003	-0.0655	0.0287	0.0032
	(-1.08)	(0.03)	(-0.25)	(1.53)	(0.27)
Controls	Yes	Yes	Yes	Yes	Yes
City, Year, Politician FEs	Yes	Yes	Yes	Yes	Yes
Observations	2,036	2,036	2,304	1,992	4,224
Adjusted R^2	0.984	0.981	0.603	0.976	0.976

Table A4: Exclusion Conditions (Using Actual Turnover)

This table reports the regression results for exclusion conditions using actual political turnover cycles. Panel A shows the relationship between the instrument, *First3A*, and CDB loans outstanding and several other potential channels at the province-industry-year level. Specifically, column (1) shows the first-stage results of regressing CDB provincial industry loan amounts on *First3A*. *LogProvLoan* is the logarithm of annual province-industry outstanding CDB loan amounts. *First3A* is a dummy variable for whether a city secretary is in the actual first three years of his/her term and where the city's largest SOE industry (i.e., focal industry) is in the same industry as that of provincial industry loans. Industry fixed effects and province×year fixed effects are included, and standard errors are clustered at the province level. Panel B regresses CDB city loans on the actual city secretary's turnover cycle and shows the regression results of alternative channels on the actual political turnover at the city-year level. *LogCityLoan* is the logarithm of CDB total loans outstanding at the city-year level. *Year1-3A* is a dummy variable that equals one if a city secretary is in the actual first three years of his/her term. Control variables include city-level GDP, population, urban income, and the number of workers. City, year, and politician fixed effects are included, and standard errors are clustered at the city level. See the Appendix Table for detailed variable definitions. *t*-statistics are reported in parentheses. *, **, and *** indicate the statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Province-Industry level

	1	2	3	4	5	6
	CDB Loan	Other Potential Channels				
Dep. Var.	*LogProvLoan*	*OverallTax*	*IncomeTax*	*VAT*	*Subsidy*	*ForeignCap*
First3A	0.5257***	-0.0002	0.0001	0.0004	-0.0004	-0.0017
	(3.84)	(-0.15)	(0.03)	(0.63)	(-1.07)	(-1.06)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Province×Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5,575	5,575	5,575	5,575	5,575	5,575
Adjusted R^2	0.335	0.556	0.747	0.774	0.091	0.314

Panel B: City level

	1	2	3	4	5
	Other Potential Channels				
Dep. Var.	*LogFiscalInc*	*LogFiscalExp*	*LogLand*	*LogBankLoan*	*LogTransfer*
Year1-3A	-0.0185	0.0014	-0.0605	0.0222	0.0104
	(-1.58)	(0.14)	(-0.19)	(1.07)	(0.78)
Controls	Yes	Yes	Yes	Yes	Yes
City, Year, Politician FEs	Yes	Yes	Yes	Yes	Yes
Observations	2,084	2,084	2,291	2,023	4,170
Adjusted R^2	0.983	0.981	0.593	0.974	0.974