The Reverse Bail-Out of Indebted Local Governments by Local Firms

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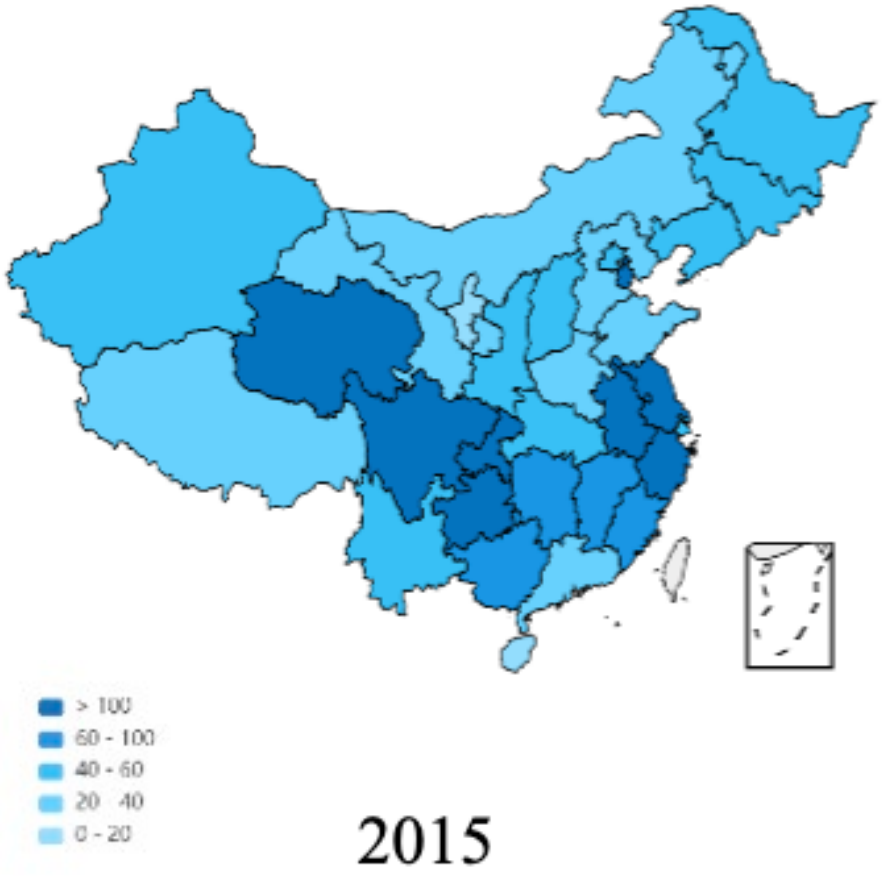
March 11, 2022

Local Gov’t Maturing Debt / Fiscal Income



2015

2020

Roadmap

- Local government debt in China has risen.
- Research Question: What is the impact of local government indebtedness on local firms?
  - Contagions from local governments to local firms.
- Highly indebted gov't delay payments to their suppliers
  - Reverse bail-out (forced)
- Expropriation channel: Suppliers do not appear to willingly finance the gov't:
  - Firms more likely to fail
  - Payment delays concentrated among non-SOE suppliers
  - No evidence of future favors nor correlation of supplier financing & cost of capital
  - Subsequently less likely to become government suppliers ("trick me once")
- Extant research shows government procurement/expenditures have positive spillovers

Related Literature

- Gov’t Procurement & Spillovers on firms:
  - Ferraz et al 2016, Liang et al 2017, Cong et al 2019, Huang et al 2020, Goldman 2020, Brogaard et al 2020, Beraja et al 2021
- Role of Local Govt in China:
  - Li and Zhuo, Jin et al 2005, Han and Kung 2015, Bai et al 2016, Lv et al 2020
- China government debt:
  - Feng 2013, Sun 2019, Amstad and He 2020, Hachem 2018, Wu 2019, Chen et al 2020, Gao et al 2021

Agenda

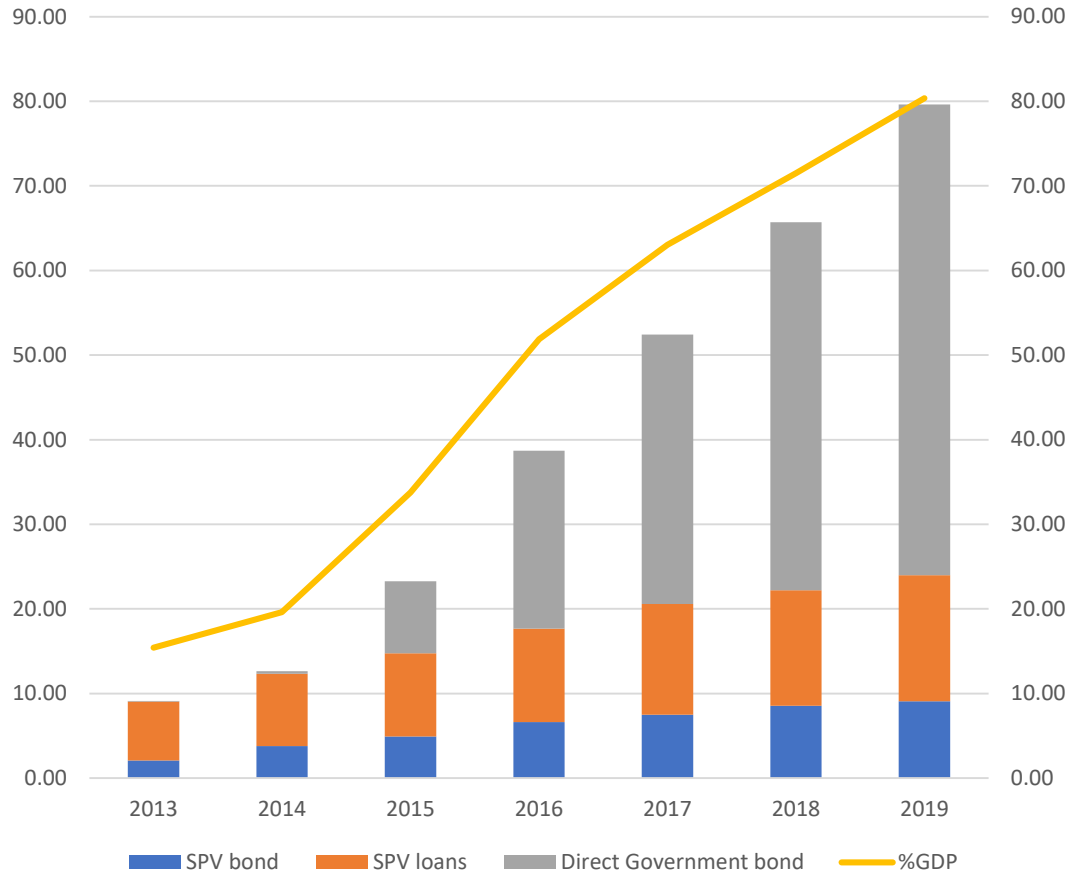
1. Background on local gov’t debt & procurement
2. Data & Empirical Specification
3. Baseline results
   - Robustness & IV
4. Why might local firms finance governments?
5. Real Effects

Background of Local Gov't Debt

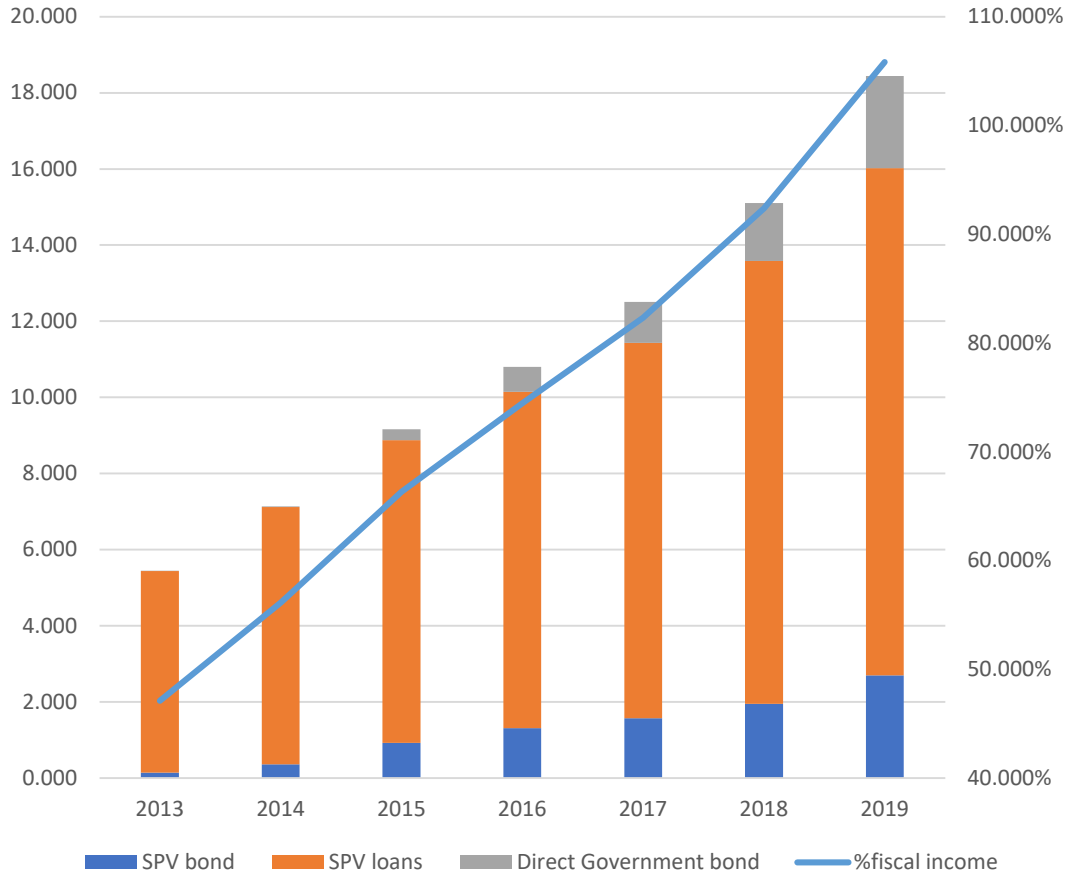
- Local government debt vs Local government financial vehicle (LGFV)
- No government debt before 2014
  - 4-trillion Fiscal stimulus post financial crisis in 2008: Bank loans
  - Central government does not allow to rollover in 2012 (Chen, He, Liu JFE 2020)
  - Turn to LGFV
- 2013: National Audit Office report on outstanding gov't debt in 2013: local gov't debt obligations > 100% of fiscal income:
  - 3 out of 34 provinces
  - 99 city gov'ts out of 385
  - 195 county gov't out of 2,000
- New Budget Law in 2014 allow local gov't to issue debt if State Council approves
  - 2015: central gov't require local gov't SPV debt to be converted into more transparent local debt by 2018
  - Moody warns of systemic risk of local debt, lower Chinese sovereign rating from Aa3 to A1 in 2017.
- By 2019: 11,567 local gov't financing vehicles, < 20% provincial, 56% city-level, and > 20% county-level (cost of capital ~ 5.5%)

Most Maturing Debts are LGFV Debts

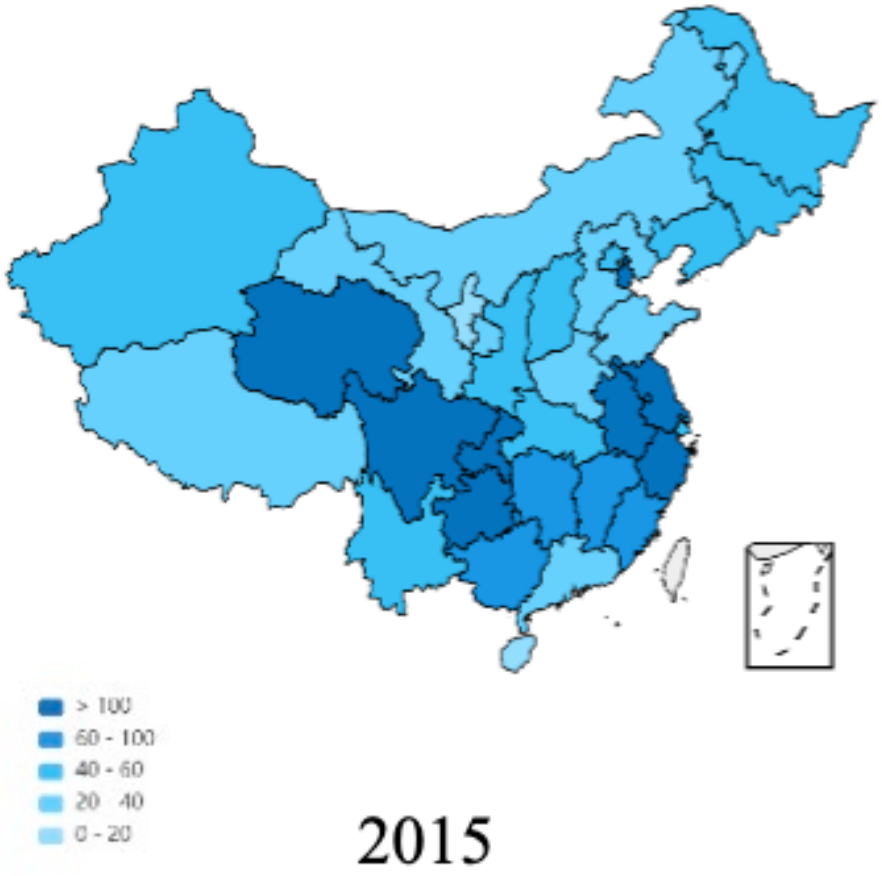
Amount of Local Gov't Debt
To local GDP



Amount of Maturing Gov't Debt
To Fiscal Income



Huge cross-sectional heterogeneity



2015

2020

Government Procurement

- Sincw 2015, Local gov’ts must report all procurements under the Government Procurement Law
  - See identity, price, quantity within 2 working days after the decision
- >95% of gov’t procurements supplied by private companies, 77% SMEs
- But local gov’ts have some flexibility on payment terms. Do not need to report payment details
- By 2018, > 0.89 tn RMB of overdue repayments
  - Little company recourse: 2,806 cases of firms taking gov’t to court, more than 55% were rejected before trial.
  - Even if suppliers win and there is a judgment, no clear enforcement mechanism.
  - Many more do not even dare to sue.
- As of Aug 2018, 480 local gov’ts in China are on the “dishonest debtor” list, as they default on procurements at least once

Data Sources

1. China Government Procurement website
   - Local government, auction winner, amount, (quantity + prices)
   - 2013 to 2019, covering 32 provinces and 324 cities
2. Corporate financial statements from Oriana (Asian part of Bureau van Dijk)
   - For headline financial statement information (current assets, liabilities, account receivable), directors, contracts
   - Frequently used for trade credit & credit rating, so headline variables data seems usable
3. Government debt from WIND
   - Local gov't bonds: issuer, maturity, amount, coupon
   - SPV (LGFV) data through name-link, covers ~ 70% of all LGFVs (100% of those that issue bonds)
     - Some issues: Asynchronous, as SPV entity only shares financial statement info when issuing.

<u>Key variable:</u>

total local gov't debt = local gov't bond + SPV bond + other int.-bearing debt of SPVs

- Sampling Restrictions:
  - Firms that are ever supplier to local gov't
  - Restrict to company w/ at least 3 years of info
- Final sample: ~ 28,500 2014 to 2019 firm-year panel. 7,750 firms from 295 cities, Avg 1.7 contracts per firm

Summary Statistics

- 28,483 firm-year obs

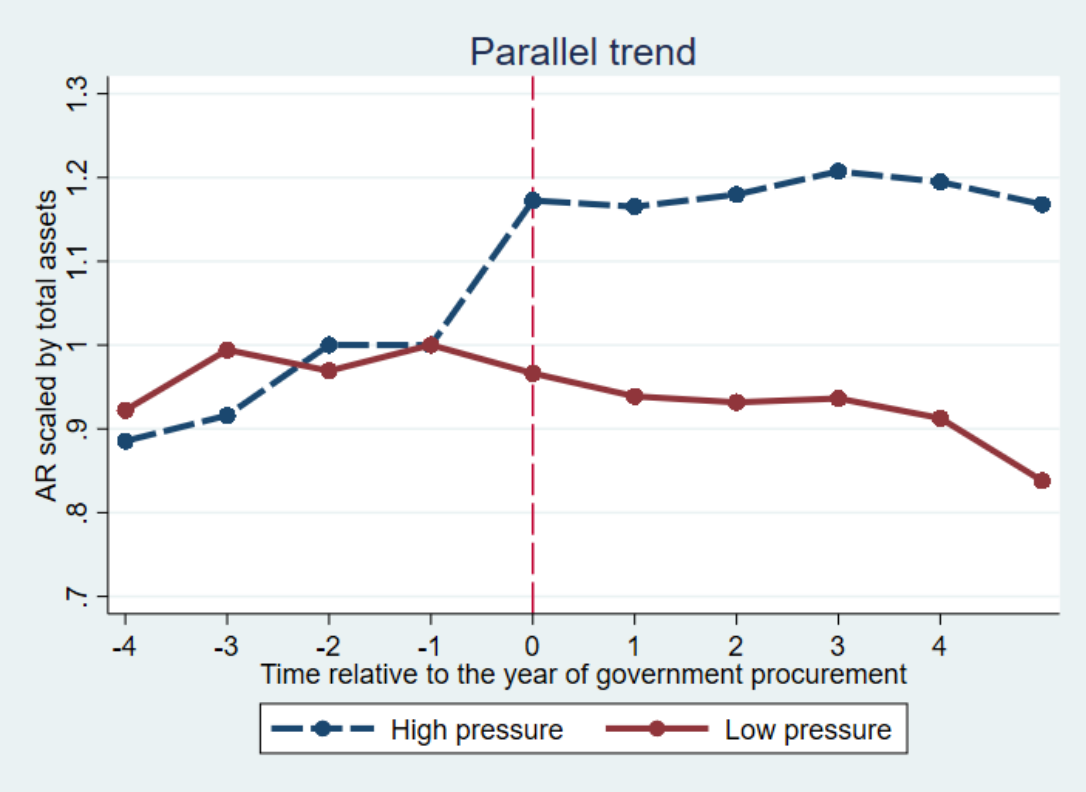
Variable	Mean	St. Dev.	P25	Median	P75
Panel A. Key variables					
Account receivable (% of Tot.Asset)	26.040	20.760	9.688	22.250	37.930
1[Gov. Supplier]	0.751	0.433	1	1	1
1[Gov. Pressure]	0.436	0.496	0	0	1
Panel B. Firm characteristics					
Tangible asset (% of Tot.Asset)	15.300	18.830	1.600	7.213	22.890
Cash (% of firm Tot.Asset)	22.690	21.500	6.583	15.570	32.200
Asset turnover	132.100	145.100	58.240	96.730	161.400
Leverage ratio	3.975	11.510	1.406	2.022	3.490
ROE	5.932	40.410	0.490	4.510	14.410
Tot. Sales (in Million RMB)	70.800	84.040	11.720	36.140	99.640
Fixed asset growth (%)	8.360	22.310	5.290	9.430	13.570
R&D (% of operating funds)	7.680	8.267	2.600	5.910	10.060
Contract amount	1.442	1.351	1	1	1
1[Reliant on government]	0.508	0.500	0	1	1
1[Corporation group]	0.655	0.475	0	1	1
1[Expanding]	0.215	0.411	0	0	0
1[SOE]	0.018	0.131	0	0	0
1[Connected]	0.000	0.018	0	0	0
1[Listed]	0.048	0.214	0	0	0
1[HighTech]	0.287	0.452	0	0	1
Interest cost	0.076	0.152	0.000	0.010	0.159
External-finance dependence	0.123	3.116	-2.104	0.093	1.248
Price of other contracts	31.3	736.5	0.783	2.516	8.411
Tax (% of Tot. Assets)	0.788	1.498	0.022	0.259	0.981
1[liquidated]	0.492	6.994	0	0	0
1[Sued]	0.319	5.643	0	0	0
Panel C. Procurement characteristics					
Procurement (Million RMB)	25.330	3206	0.500	0.720	1.580
1[Maturity >1 year]	0.000	0.016	0	0	0
Adj. Post Supply	0.751	0.433	1	1	1
1[Goods]	0.123	0.329	0	0	0
1[Service]	0.453	0.498	0	0	1
1[Construction]	0.361	0.48	0	0	1
Panel D. Government characteristics					
1[Corruption]	0.384	0.486	0	0	1
Gov. Expenditure (% of GDP)	40.250	90.790	1.690	5.206	24.240
Gov. Procurement (% of GDP)	0.382	1.253	0.003	0.023	0.220
Gov. debt (% of fiscal income)	71.700	84.260	11.220	54.490	77.730
GDP growth	-707.400	3791.000	0.984	8.186	90.290
Investment growth	8.362	22.310	5.293	9.428	13.570
Loan growth	13.000	4.642	9.610	12.800	15.600
Size of debt issuance	405.400	433.900	61.000	186.900	770.100
Average maturity of debt	3.524	1.433	2.656	3.200	4.400
1[Having higher leader]	0.005	0.072	0	0	0
1[Having higher leader 5 years ago]	0.046	0.209	0	0	0
1[Exclusive Government]	0.476	0.499	0	0	1
Average ETC	16.060	12.190	10.800	17.600	19.500
Property protection index	7.110	1.471	6.900	7.410	7.580

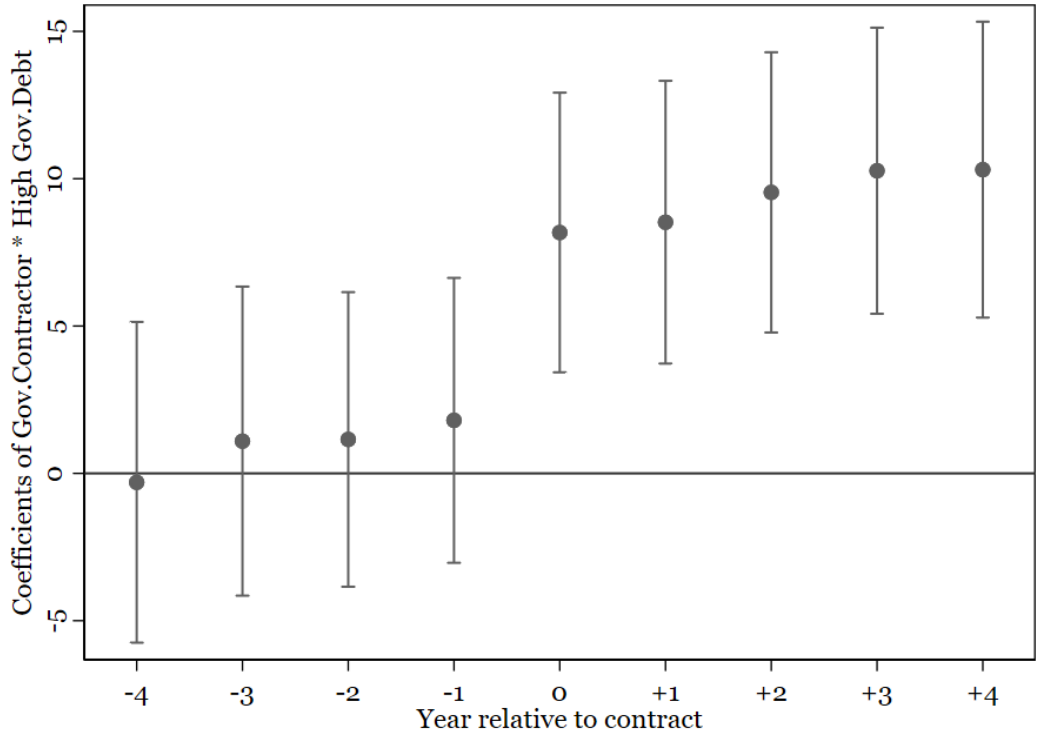
Empirical Specification ("DiD" but not rly)

$$y_{i,t} = \theta_i + \mu_{c(i),t} + \alpha_{j(i),t} + \beta 1[\text{Supplier}]_{i.t} \times 1[\text{High pressure}]_{c(i),t} + X'_{i,t-1}\Gamma + \varepsilon_{i,t},$$

- where i indexes a firm, $j(i)$ indexes an industry, $c(i)$ indexes a city and t indexes a year
- $y_{i,t}$ is AR/Total Assets, other corporate outcomes
- "Treated" is matching w/ a highly indebted gov't, "Post" is after they become a supplier
- $1[\text{High pressure}]_{c(i),t}$ = 1 if local gov't in city has higher than median debt-to-income ratio or higher-than-median debt interest premium
  - Median within year, so purely cross-sectional comparison to avoid overweighting recent years
- α_i denotes firm fixed effects and $\alpha_{j(i),t}$ denotes industry-by-year fixed effects.
- $X'_{i,t-1}$ includes total assets, leverage ratio, asset tangibility, local GDP growth rate
- SE cluster at firm level

Rise in Accounts Receivable around government supply





Baseline Results

- Column (1): suppliers to indebted gov't have 7.3 million RMB (~ 1.1 mn USD) more AR after contract, ~ 30% of avg total value of gov't procurement

Empirical Specification	Firms' account receivable			
	With Controls, Without FE	controls and firm FE/city FE/year FE	Controlling for industry Investment Opportunity	Intensity of indebtedness
	(1)	(2)	(3)	(4)
1[Supplier] * 1[High Pressure]	6.849***	1.735***	1.983***	
	(0.595)	(0.390)	(0.435)	
1[Supplier] * 1[High Pressure(Q2)]				-0.242
				(0.412)
1[Supplier] * 1[High Pressure(Q3)]				-0.362
				(0.442)
1[Supplier] * 1[High Pressure(Q4)]				1.943***
				(0.566)
Firm FE		✓	✓	✓
Year FE		✓	✓	✓
Industry x year FE		✓	✓	✓
City x year FE			✓	✓
Observations	28,484	27,913	22,167	22,167
R2	0.22	0.78	0.78	0.78

Baseline Results

- Suppliers to more indebted governments provide more short-term financing for governments compared to those less indebted governments
- Robustness:
  1. Survives controlling for project types (constructions, etc)
  2. Split sample on contract scale (size & time to completion of diff projects)
  3. Not driven by big events like anti-corruption campaign (as local gov’ts w/ more debt are typically targeted)
  4. Doesn’t appear to be accounting manipulation (survive removing conglomerates, later will look at politically connected firms..)

Main Endogeneity Concerns

1. Matching of local gov't w/ firms
   - No pre-trends
   - Main spec has industry*year FE, some also city*year FE
   - Signalling? Higher AR firms carry more working capital, signal strength
     - No result on high previous firm growth on AR accumulation around supplying highly indebted gov'ts
   - Follow Anderson (2008) to make a firm index & contract index to capture different features and include interactions with year as controls
   - Procurement behavior also doesn't change around high indebtedness
2. High government debt, correlated with local economic growth & AR
   - Controlled for city characteristics, also some specs city*year FE
   - Result survives for firms supplying governments not in firms' home city
   - Procurement behavior also doesn't change around high indebtedness
   - Finally, IV…

Instrumental variables analysis

- Instrument: change in political connection of previous city leader 5 years ago
  - More connected five years ago, could issue way more debt
  - Using debt issuance from 2009 onwards (as our sample starts in 2014)
- Identifying assumption: previous leader five year ago can affect current stock of maturing government debt, but not so much the local government economic conditions or matching between gov't and firms anymore. (Supplier firms in other cities)

$$1[\text{High pressure}]_{it} = \beta 1[Political\ Connection]_{i.2008-2012} + \theta_i + \mu_c + \varepsilon_{it},$$

- where $1[Political\ Connection]_{i.2008-2012}$ is a dummy variable that equals 1 if the local leader between 2008 and 2012 had a working experience with then provincial leaders and 0 if otherwise.
- SE clustered at city-level
- Placebo's regress local GDP growth rate, infrastructure growth, loan growth rate on past connection and find they aren't highly correlated with instrument

Instrumental variables analysis

Kleibergen-Paap F-stat suggests the instrument isn't weak. SE's clustered by city

	Panel A First and second stage		
	1st stage: OLS	Reduced form	2SLS
Dep. Var.	1[High Pressure]	Firms' account receivable	
	(1)	(2)	(3)
1[connected leaders]$_{2008\text{-}2012}$	0.414***	0.669	
	(0.051)	(1.027)	
1[Supplier]		1.824***	5.382*
x 1[High Pressure]		(0.397)	(3.235)
City dummy	Yes	Yes	No
Year dummy	Yes	Yes	Yes
Industry*year dummy	Yes	Yes	Yes
Observations	27912	27912	28483
R2	0.686	0.834	
F-stat	88.47***		

Instrumental variables analysis

- IV estimate > OLS estimate. Kind of makes sense.
- Local firms that expect to work with an indebted gov't may negotiate for more protection on payment terms.
- So, baseline results may be under-estimated due to the forward-looking nature of private firms.
- But raises the question: Why do firms still participate?

Why do local firms' finance local gov'ts?

- **Hypothesis 1:** Quid pro quo. They get something else in return. If quid pro quo,…
  - Firms w/ lower cost of capital and less dependent on external finance more likely to extend credit.
  - Suppliers with more AR increases get more contracts later, lower taxes, or land purchase opportunities, or higher price.
  - More politically connected firms provide more financing.
- **Hypothesis 2:** Local Gov't Expropriation. If expropriation,…
  - Firms forced to lend to local gov't will not become contractor again
  - Firms with more property rights protection (based on an index from Cai et al 2011 JLE) should have less increase in AR
  - Smaller, non-politically connected firms will see a bigger rise in AR and SOEs will see smaller rise in AR
  - Firms in industries of less strategic importance (i.e. not tech) will see more payment delays

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Hidden/hard to detect govt debt drives effect

- Maybe firms don't know how indebted the government is?

Key indicators =	Government Bond Share (Easiest to Detect)		SPV Debt (Hardest to Detect)	
Subset Type =	High Gov't Bond Share	Low Gov't Bond Share (More SPV Bond & Debt)	Low SPV Debt	High SPV Debt
	(1)	(2)	(3)	(4)
1[Gov. Contractor] * 1[High Gov. Debt]	0.650	1.440**	1.313	1.617***
	(1.532)	(0.715)	(0.852)	(0.561)
Control variable	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Industry x year FE	Yes	Yes	Yes	Yes
Observations	10,365	10,578	9,856	10,563
Adjusted R-squared	0.824	0.773	0.769	0.804

Real Implications

- Isolating increase of AR due to supplying highly indebted government (IV).
- Firms with bigger increase in AR:
  - More likely to be sued (taken to court by their own suppliers)
  - More likely to be de-registered
  - Draw down cash reserves
  - Lower R&D expenditures
- What about pass-through of AR rises through to AP rises?

	Panel A: Impact over the survivorship			
	1[Get Sued]$_t$		1[Get deregistered]$_t$	
	OLS	IV	OLS	IV
	(3)	(4)	(1)	(2)
Firms' AR$_{t-1}$	0.006*	0.016**	0.014**	0.014**
	(0.003)	(0.008)	(0.006)	(0.007)
Observations	23,183	23,183	23,183	23,183
R2	0.118	-	0.0586	-
	Panel B: Impact over firms' behavior			
	R& D expenditures$_t$		Cash holding$_t$	
	OLS	IV	OLS	IV
	(1)	(2)	(3)	(4)
Firms' AR$_{t-1}$	0.021	-0.434***	-0.015***	-0.107***
	(0.015)	(0.156)	(0.001)	(0.004)
Observations	4,072	4,072	23,183	23,183
R2	0.175	-0.556	0.231	-0.930

Some evidence of ripple effects

Dependent variable.	Account Payables	Working capital gap (Account receivable-Account payable)	Receivables Turnover (Days)	Payables Turnover (Days)
	(1)	(2)	(3)	(4)
1[Gov. Contractor] * 1[High Gov. Debt]	0.827*	1.067*	6.248**	0.028
	(0.468)	(0.597)	(2.979)	(2.684)
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Industry x year FE	Yes	Yes	Yes	Yes
City x year FE	Yes	Yes	Yes	Yes
Observations	21,423	21,423	22,008	21,536
Adjusted R-squared	0.696	0.698	0.724	0.701

Higher AR not due to higher sales (column 3) nor due to higher passthroughs (column 2), although AP does rise

Conclusion

- Highly indebted governments delay payments to firms
- Almost like a “pecking order” of which gov’t suppliers get paid first:
  - Those connected, larger, in high-tech, in areas with more property rights,
- Appears like expropriation of local firms, as they
  - are less likely to be suppliers in the future,
  - cut R&D,
  - draw down cash, and
  - are more likely to die
- Some potential ripple effect through slight rise in AP, i.e. owing their suppliers