The Trickle-Down Effect of Government Debt and Social Unrest[1]

Ben Charoenwong[2]

Meng Miao

Yongxiang Wang

Zhengyu Zuo

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Abstract

Using a dataset of all publicly-available local government procurement contracts in China, we study the social costs of local government debt. Highly indebted local governments delay procurement payments to their contractors, who in turn delay salary payment to their employees. This trickle-down effect causes a deterioration in firm fundamentals and sparks employee protests. Our findings are (1) are not driven by local economic conditions, endogenous government indebtedness, or self-selection into becoming government suppliers, (2) do not apply to government-linked firms, and (3) are larger for firms in areas with weaker labor and property rights.

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[2] Ben Charoenwong, Email: ben.charoenwong@nus.edu.sg, National University of Singapore Business School, 15 Kent Ridge Dr #07-69, Singapore 119245. Meng Miao, Email: miaomeng miaomeng@ruc.edu.cn. Yongxiang Wang, Email: yxwang@saif.sjtu.edu.cn. Zhengyu Zuo, Email: zoezhengyu@outlook.com . Any remaining errors are our own.

1. Introduction

The post-Covid-19 era witnessed an unprecedented aggregate of US$226 trillion in government debt in developing and industrialized nations (IMF 2021), raising concerns about fiscal stability. Over the past several decades, sovereign risks in emerging markets revealed that government defaults have significant consequences in international financial markets and local economies (Bulow and Rogoff 1989; Reinhart and Rogoff 2004; Hébert and Schreger 2017). However, the hazards of excessive government debt may extend beyond economics. Because of their monopoly on the use of force, indebted governments have an incentive to shift debt burdens to politically weaker parties (Gao et al. 2021).[3] This has historically left politically weak constituents with no alternative but to demonstrate and protest (Fukuyama 2011), which come at a significant cost to the government. For example, in China in 2021, the government allocated over 5% of its total spending (approx. 190 billion yuan or US$28 billion) on public security to "maintain social stability."[4] Yet, this social cost of government debt has not been documented, even though social unrest has been shown to play a significant role in dismantling and reshaping societies (e.g., Knight 1991; Acemoglu and Robinson 2000; King and Pearce 2010; Dupas and Robinson 2012).

In this paper, we document evidence of the social costs of local government indebtedness in China. As of 2019, local government debt climbed to an average of 80% of the total GDP and approximately 788% of the local government's fiscal income, posing systemic vulnerabilities (Lu and Sun, 2013; Barnett and Zhang, 2014; Ang et al., 2016; Amstad and He, 2020; Chen et al., 2020). In comparison, the United States city of Detroit defaulted in June 2013 with a debt-to-fiscal-income ratio of almost 700%. However, the formal bankruptcy of Chinese local governments is impossible due to the absence of a government bankruptcy code in China and local government officials' political reluctance out of fear of punishment by the central government.

[3] Countries whose institutions like an independent judiciary (Sussman and Yafeh 2000; La Porta et al. 2004; Visaria 2009) and enforcement of property rights (Levine 2005; Berkowitz et al. 2015) are weaker typically see powerful and politically connected individuals receive preferential terms in a myriad of economic activities, often at the expense of their less fortunate peers (Faccio et al. 2006; Calomiris et al. 2010; Qi et al. 2010).

[4] For comparison, the amount spent on education was 169 billion yuan (approx. US$25 billion) and general public services was 157 billion yuan (approx. US$23 billion).

We document a trickle-down effect: Debt pressure is passed from the political strongest with the greatest debt capacity to the weakest with the greatest debt vulnerability. Namely, we show that local governments with a large amount of debt due in a given year relative to their fiscal income delay or default on payments to non-politically connected suppliers, typically Small and Medium-Sized Businesses (SMEs). With greater accounts receivable and deteriorating financial status, these suppliers are more likely to default on their weakest employees, typically migrant workers. The delayed wage payment then causes desperate and politically marginalized migrant workers to take to the streets in protest of wage nonpayment. Meanwhile, government-linked firms do not see payment delays nor increased probability of employee protests.

We investigate this trickle-down effect of government debt on private firms by combining four main data sources: (1) a comprehensive dataset on all government procurement contracts in China, (2) detailed government debt data, including bonds as well as local government financial vehicles (LGFV) bond and bank financing, (3) data on firms' financial statements covering both public and private firms, and (4) detailed data on local protests in China. Like Beraja et al. (2022), we employ a difference-in-difference empirical framework, comparing firms getting government procurement contracts from highly leveraged vs. less indebted cities.

After becoming a supplier, firms providing to more indebted governments have a 2.38-percentage-point rise in accounts receivable relative to total assets compared to firms supplying to less indebted governments in the same industry at the same time. The high account receivables appear to have other financial consequences, corresponding with lower cash levels, investment expenditures, and R&D spending. There is also some evidence along the supply chain, as affected firms also increase their accounts payable, albeit by a lesser amount than their accounts receivable. These results suggest that these companies are unsuccessful in fully shifting the burden of the trickle-down effects of government debt onto their suppliers. Firms that contract with heavily indebted governments are also more likely to face employee protests regarding payment delays. The likelihood of employee demonstrations increases by around 0.18%, around 10% relative to the unconditional mean.[5] Robustness checks suggest that our

[5] Note that the match from protests to employers is incomplete as not every protest contains information on a firm. Appendix Table A.5 repeats our analyses at the city level instead, which retains all the data on local protests, and

results are not driven by various alternative factors, such as the measurement of government indebtedness, the changes in local economic conditions, time-to-build concerns or repeated procurement contracts, and the Chinese Communist Party's anti-corruption campaign that usually paralyzed the investigated local government.

Our results seem surprising given that Chinese governments have expended significant resources in maintaining social stability. In 2021, the central government spent 189 billion yuan on public security, which was a substantial amount relative to other programs such as education (169 billion yuan) and general public services (157 billion yuan). This represents 5.4% of the federal government's expenditures (excluding transfers to localities). However, our findings show that highly indebted and poorly disciplined local governments have stoked protests by defaulting on payment to weak and politically unconnected SMEs. The central government has issued policies in recent years to prevent such conduct but the effect is minimum[6]. Apparently, to check the actions of local governments, fundamental institutions such as the enforcement of property rights and an independent branch of jurisdiction are far more effective than the administrative order from a superior government.

However, two types of endogeneity could potentially hinder our causal interpretation of the results. The first endogeneity is that government debt, the financial distress of local businesses, and protests may be merely the result of slow regional economic growth or other regional factors. We apply three approaches to resolve this issue. In our baseline specification, we first control for local GDP growth and other alternative metrics of economic growth and find that the additional control variables do not affect our findings. Second, we investigate the subsample of suppliers located in different cities from the local governments they serve. As the government and suppliers are not located in the same city, it is unlikely that the same regional economic shocks are being captured. We find that the sub-sample of data from different city suppliers is nearly comparable to our baseline result, mitigating the concern that regional economic shocks confound our results.

generates a point estimate over three times those reported at the firm-year level.

[6] See http://english.www.gov.cn/news/policy_briefings/2019/02/26/content_281476538953230.htm and https://www.ft.com/content/0b831a12-6101-4420-8629-8d73f1dded91

To further alleviate this endogeneity, we use an instrumental variable (IV) approach to isolate the component of government debt that is plausibly exogenous to local economic factors. Motivated by the existing literature, the instrument for government debt is an indicator variable for whether there are ministerial-level or higher national policymakers born in the city, following Huang et al. (2020). According to a substantial body of research, such political ties are related to increased municipal fiscal expenditures, which may increase government debt (e.g., Gao et al. 2021, Bai and Jia 2016, Fisman et al. 2020) in the past. Then, the amount of government debt from past issuances maturing in a particular year is plausibly exogenous to local economic factors. In this analysis, we find that the IV results are larger than the OLS results. This difference suggests that the endogeneity introduces a downward bias. This is plausible for at least two reasons. First, local government debt issuance may be positively associated with future growth prospects and procurements. Therefore, isolating the variation in government debt from the past and not correlating with future growth prospects increases the point estimate on our main effects. Second, local firms, expecting that an indebted government may delay its payment for procurement contracts, would likely be more conservative and seek more protective terms like a higher prepayment in their contracts. Either or both of these effects will cause our baseline results to be underestimated due to the discreet business conduct of private firms.

The second endogeneity is the self-selection of firms to become government suppliers. For example, on the one hand, firms closer to fiscal distress may gamble for resurrection by contracting with governments in case they get repaid. This implies the estimated trickle-down effects are overstated. On the other hand, firms may also use contracting with indebted governments as a costly signal to other potential customers of their financial condition. This implies the estimated trickle-down effects are understated. We conduct three checks to alleviate this endogeneity concern. First, our results are unaffected if we remove firms with rapid growth in total sales, as those with fast expansion, may be more prone to overextend their resources and become insolvent later. Second, we construct an index constructed from observables, similar to Beraja et al. (2022), to control for numerous firm- and region-specific characteristics that may influence the selection of local firms to be chosen as government suppliers. Third,

firms that have entered contracts with the government early only see large increases in accounts receivable after they become suppliers to indebted governments.

In addition, we provide three additional empirical results that suggest firms do not appear to extend credit to indebted governments voluntarily. First, the firms lending to the government through trade credit tend to be smaller and have higher costs of capital. Second, we do not find evidence of quid-pro-quo as firms lending to the government do not appear to win future government contract bids, tax benefits, or land quotas. In fact, more than sixty percent of firms only engage in a single government contract, and those that have supplied to highly indebted governments are less likely to repeat government contractors. Third, the trickle-down effects appear driven by hard-to-detect government debt. Potential suppliers may look at a local government's balance sheet and evaluate whether it is fiscally sound. We define transparent government debt as government bonds and define less-transparent debt as those originating from LGFVs, which require firms to match LGFVs to local governments. We find that less transparent debt drives the trickle-down effects.[7] Altogether, these results are most consistent with firms being forced to share the burden of government debt involuntarily rather than potential insider transactions with the government.

We further corroborate the trickle-down effect of government debt on firms with four more heterogeneity tests. First, we find that the relationship between government debt and local suppliers becoming the subject of protests is stronger when the awarded suppliers' procurement contract value is greater, indicating that the firms are undergoing a more severe liquidity shock. Second, the effect is also more pronounced in regions with fewer property rights, where businesses may be more subject to expropriation by local governments. Similarly, the trickle-down effect of government debt only exists among non-politically connected suppliers, consistent with existing U.S.-based studies indicating that politically-connected government suppliers can renegotiate with the government (Brogaard et al., 2021). Third, the effect is diminished in areas with more employee protections. Fourth, firms with less liquidity before

[7] A government may borrow through government bonds or LGFVs loans and bonds. The latter is substantially less transparent than the former, as investors do not have easy access to the identities and financial statement information of LGFVs. Taking a slightly different definition splitting transparent debt into all bonds (from governments directly or from LGFVs) and debt coming from non-bonds (which include bank debt) also shows that the effects are larger for non-bond debt.

the indebted government's payment delays see more employee protests, suggesting that the liquidity of local suppliers is the driving force behind their being the target of local demonstrations.

What are the characteristics of employees who protest non-payment of wages? We find that the estimated effect is greater when local firms operate in industries that employ more low-skilled employees. In addition, this collective action is more prominent in firms with a more homogeneous labor force, such as those with similar demographics and kinship ties to the same hometown.

Moreover, the local governments, aware of potential collective actions by workers due to delayed payments, strategically moderate their default behavior under fiscal constraints. We show that the government, learning from past collective actions, will be less likely to delay payments to enterprises that have previously experienced such actions to minimize negative impacts. The finding indicates that while fiscal pressure increases payment delays, the threat of collective action independently compels the government to consider political costs, thereby reducing the degree of defaults.

Our paper documents some social consequences of delayed government repayment in China attributed to high debt burdens, an economic burden not limited to just China. Many developing nations share institutional problems studied in this paper, such as the absence of checks and balances over the government and the lack of property rights. For example, the Indian government delayed 8.7% of its procurement payments to small and medium-sized enterprises (SMEs),[8] a rate that has increased over the years, and 132 thousand cases have been filed against the government by SMEs since 2017[9].

Related Literature

Our paper contributes to the literature on the Chinese government debt. A group of literature has discussed the origin and sustainability of Chinese government debt (Feng, 2013; Sun, 2019; Amstad and He, 2020). Some focused on their nexus with the shadow banking system (Hachem, 2018; Wu, 2019; Chen et al., 2020; Gao et al., 2021). However, few have

[8] https://blog.theleapjournal.org/2021/03/how-large-is-payment-delays-problem-in.html
[9] https://samadhaan.msme.gov.in/MyMsme/MSEFC/MSEFC_Welcome.aspx

explored the impact of rising government debt on firm behaviors (Liang et al., 2017; Cong et al., 2019; Huang et al., 2020). To our knowledge, ours is the first paper on how the government's financial conditions affect private firms. Our research also challenges the long-held belief that governments bail out banks and companies during financial crises in general (Blau et al., 2013; Hung et al., 2017) by studying the behavior of local governments.

We also contribute to the government spending and procurement literature, which focuses on the underlying corruption, collusion, and welfare loss from discretionary awarding decisions, especially in emerging markets. (Mahmood, 2010; Pontré et al., 2011; Dastidar and Mukherjee, 2014; Fazekas and Kocsis, 2020) Our paper, however, focuses on the post-procurement effects on firms. A closely related paper to ours is Beraja et al. (2022), who explain part of the rapid development of AI companies in China due to the government procurement and sharing of big data. We emphasize that the government may expropriate companies through procurement contracts under poor property protection and institutions, whereas existing research like Ferraz et al. (2016) shows that government procurements increase supplier firms' growth.

Our paper is also related to the literature regarding the nature of the government studying whether the government is the helping or grabbing hand and the government's role in economic development. (Shleifer and Vishny, 1993, 1994; Frye and Shleifer 1996; La Porta et al., 1999). Sánchez De La Sierra (2020) suggests that the form of the government, exploitive or not, would be highly determined by the difficulty of monopolizing the main resource. We complement that literature by suggesting that the nature of the government could be contingent on its financial status, similar to Germaschewski et al. (2021) who show a model with government expenditure and expropriation better matches the macroeconomic data for China.

Finally, our paper is related to the literature on economic conditions and social unrest, which has linked income inequality (Alesina and Perotti 1996; Acemoglu and Robinson 2000) and fiscal conditions (Ponticelli and Voth 2020) with collective actions. Existing literature is more focused on changes in farmers' crop incomes (Miguel et al., 2004; Miguel, 2005), and studies have also pointed to the impact of cutting off trade-based sources of income (Dell et al., 2019). Research on collective action in China has focused more on the nineteenth century. For example, Bai and Jia (2016) discussed the impact of cutting off opportunities for upward mobility on elite participation in uprisings, and Cao and Chen (2022) discussed the impact of

cutting off sources of trade on docks. This paper focuses on contemporary China and studies the unpaid wages of company employees, an important cause of collective action.

2. Institutional Background

2.1 Local Government Debt in China

Governments must sell assets or borrow to cover the difference between their income and fiscal expenditures. In China, local governments bear most of the costs of regional affairs, including primary/middle education, medical and old-age care, and the payroll of civil servants. On top of that, incentivized "promotion tournaments," government officials frequently make large infrastructure investments to stimulate the economy (e.g., Li and Zhou, 2005; Jin et al., 2005; Han and Kung, 2015; Bai et al., 2016; Lv et al., 2020). According to China's Bureau of Statistics, local governments account for an annual average of 84.5% of the total government expenditures in China in the past decade. Meanwhile, the fiscal income share of local government as a fraction of total government income has decreased over the years. Considering that local government expenditures account for more than 70% of the total government expenditure, the decline in local government income share has led local governments to have a significant fiscal gap of around 20% of the total government revenue. This has led local governments to issue more debt to finance their spending.

However, prior to 2014, local governments could not issue bonds directly.[10] As a result, government financing platforms – special purpose vehicles usually called a local government financial vehicles (LGFVs) – were established to bypass this regulation. China's local-platform debt model gained momentum following the 2008 financial crisis, when the central government launched a 4 trillion economic stimulus plan. The spending broke down into 1.18 trillion from the central government and the remaining 2.82 trillion came from local government spending. As a result, local governments had to use LGFVs for debt financing because they had no additional fiscal revenue sources. Since then, local financing platforms emerged in 2009 and

[10] The old budget law in 1995 stopped the local government from issuing debt. In addition, the Law of the People's Bank of China, which took effect during the same period, also stopped the banks from lending to local governments.

grew to 11,567 local government financing platforms in 2019. Less than a fifth of existing LGFVs are provincial-level, about 56 percent are municipal-level, and more than 20 percent are county-level.[11]

Most LGFVs are companies with no real business operations. The head of the local government or its finance department usually takes the duality position as the head of the LGFV to ensure control of the LGFV. The LGFVs borrow in two ways. First, LGFVs can issue "quasi-municipal debt" in the inter-bank market. The debts range from short-term financing notes to long-term bonds. All debt issuance needs approval from the National Development and Reform Commission. The local government can also use the LGFVs to directly borrow from banks. Those loans backed by government fiscal revenue. Local banks, which local governments ultimately own,[12] typically do not reject LGFV loan applications (Chen et al., 2020; Gao et al., 2021). While the debt issued in the interbank market is easy to track, the total amount of bank lending to the LGFV is hard to monitor by central governments, as debt issuance is entirely off the book.

To put the untraceable LGFV debt under more oversight, the New Budget Law in 2014 allowed local governments to issue debts after State Council approval. The provincial-level governments must guarantee the municipal governments' bond to motivate strict monitoring over the debt quality of the subordinate governments. The local tax revenue also guarantees the bonds for general uses, and those for specific projects are mainly repaid with corresponding land sale revenue or project revenues (e.g., highway tolls). At the same time, local governments were no longer allowed to issue new debt via LGFVs. In 2015, the central government required that the local LGFV debt be converted into local government debt by the end of 2018. Otherwise, the central governments will no longer provide any support to local government debt repayment. The local governments are also prohibited from providing guarantees for any outstanding or newly issued debts of LGFVs. However, anecdotal evidence suggests that the local governments are trying to cut the LGFV loans. For example, Chongqing city dismissed several county officials for providing illegal guarantees for LGFVs[13].

[11] Data from practitioner's report: In-Depth: Thematic research on local government debt.
[12] Another reason for the dependence of the local banks on the government is that the government usually puts its fiscal income into local banks as deposits.
[13] See the notification by Chongqing government in 2017 where a director of county finance bureau is

Local government debts have been increasing over the past years. Figure A.1 illustrates the total outstanding and maturing LGFV bonds, LGFV bank loans, and government debt. By the end of 2019, these three types of debts account for 85% of the total GDP. Before 2014, the main method for local government debt finance was LGFV loans from banks. The local government's direct debt has experienced dramatic increases ever since its inception in 2014. By the end of 2019, it has been around 55% of the local government's fiscal income. The total amount of LGFV bonds and LGFV bank loans has been almost constant over the years, reflecting an effort of local governments to replace it with government debts.

In a survey by the National Audit Office on outstanding government debt in 2013, total debt outstanding by local governments accounted for 36.74% of total local GDP; 3 provincial governments (out of 34), 99 city-level governments (out of 385), 195 county governments (out of 2000) having debt obligation more than 100% of its fiscal income[14]. The expansion of local debt raised concern over the default likelihood of local governments. In 2017, Moody warned of the systemic risks of local debt and lowered the Chinese sovereign rating from Aa3 to A1.

Since 2014, the central government has taken a policy stance that it would not be responsible for the local debt[15]. Yet despite mounting debt levels, no local governments have defaulted, as China does not have a government bankruptcy process and local government officials seek to avoid political costs associated with being the first to default. Anecdotes show that local governments make desperate moves to avoid default. For example, a distressed county government in Guangdong was forced to lease its government hall to a bar to repay its debt. So in the absence of a formal bankruptcy code and a check on their power, local governments may selectively default on suppliers to relieve their own debt pressure (Gao et al., 2021).

2.2 Government Procurement and Payment

Chinese firms can become suppliers to the government if they have relevant professional competence, well-documented financial statements, and a tax record. Local governments use

dismissed.

[14] Appendix Figure 2 shows the number of cities with the percentage of outstanding debt to fiscal income higher than certain thresholds.

[15] The No. 43 document issued by the State Council in October, 2014.

public bidding to choose suppliers. The Ministry of Finance also stipulated that small and medium enterprises (SMEs) should enjoy preferential treatment in the bidding procedure, and at least 30% of the government procurement must go to the SMEs. By the end of 2019, more than 95% of government procurements are finished by private companies, with more than 77% finished by SMEs.

According to the Government Procurement Law, for all government procurements after 2015, the local government has to disclose the relevant information such as the identity of the supplier, the price, and the quantity of the procurement within two working days after the decision was made. All information is disclosed on the China Government Procurement Website.[16]

Importantly, there is no escrow account ensuring that local governments pay procurement contracts upon delivery or completion. The payment process involves a financial department audit and progress confirmation of third-party agencies, so while governments have to pay the appropriate amount contracted, there is some discretion on the timing of payment. Those with liquidity pressures from debt obligations will not have the budget to pay and simply delay payment until a later fiscal period. Nonetheless, they have a discretion on which contracts to pay first. Official statistics report that the total overdue repayments to government procurement by the end of 2018 was at least 890 billion RMB and 480 local governments in China appear on the "Dishonest debtor" name list, meaning that they default on the procurement at least once.[17]

China's judicial system does not impose sufficient checks on its government. Under the leadership of the local Party Committee, the Chinese courts generally favor the local government in the face of conflicts between the government and the private citizens.[18] Figure

[16] http://www.ccgp.gov.cn/. Figure A.3 shows an example procurement contract disclosed.

[17] Some payment delays persist for a long time. For instance, a listed company named Orient Landscape, whose main business is to provide urban garden planting services to local governments, disclosed a total account receivable of 8.9 billion RMB, or 21.3% of its total asset. It is estimated that only 40% of its account receivable would be paid at all. One of its largest clients, the Management Committee of Binzhou Economic Development Zone, only paid 13 million out of its total of 1.5 billion unpaid procurements between 2014 and 2018.

[18] The head of Chinese courts is selected and appointed by the head of the local polity and legal commission, one division of the local party committee. This tension is typically framed as "local courts are found to be dysfunctional", and may explain why securities law in China has also yielded much lower securities suits in than expected (Huang 2013)

A.4 illustrates the total number of cases brought by government suppliers against governments that delayed payment over the years. For all 2,806 cases, the total amount of unpaid payments and interest amounted to about 106.1 billion Yuan. More than 55% of cases were directly rejected to trial by the court over the years. For those courts that allow the prosecution, it is most likely that the suppliers would win the trial. In most cases, the courts do not have the enforcement power to force the government to repay[19].

The government's non-repayment on procurement may cause their suppliers to run out of liquidity. Most banks in China do not issue loans to private firms with a more than one-year term. To finance the project longer than one year, firms need to repay the loan first after one year and rollover the loan conditional on the banks' consent. Suppose the government failed to repay the suppliers within one year. In that case, the supplier must borrow from other resources to fill the funding gap caused by the account receivable against the government. Failing to do so would mean that the firm would default on its bank loans and be listed as the "Dishonest Debtor." Given that private firms face credit rationing from banks, many suppliers are financially constrained. As a result, it is not uncommon for firms to borrow expensive private loans, which charge an interest rate of 24% to finance their account receivable to the government.

Meanwhile, payables may exhaust the firms' working capital, leading to the failure to repay its upstream suppliers in time. If so, the government's debt pressures are passed among private firms along their supply chains as well. During the bankruptcy procedure in China, when one debtor borrows from multiple creditors, it is usually the case that creditors have the first-move advantage. Within the same debt seniority group, those who first litigate and liquidate the firm may grab more assets and benefit from their first-mover advantages. Therefore, those distressed government suppliers risk being run by the creditors and liquidating prematurely.

[19] See paper Untrustworthy Behaviors of a Few Local Governments and Their Governance Strategies issued by *People's Tribune*, a journal edited by the newspaper office of Central Committee of the Chinese Communist Party. It mentions "The most common breach of trust is the government's refusal to comply to the rule of the people's court after losing a lawsuit."

3. Data and Methodology

The data in this paper comes from four different sources: (1) government procurement, (2) government debt, (3) corporate financial information, and (4) local protests information. First, we collect information on more than one million procurement announcements between 2013 and 2019, covering a total of 32 provinces and 324 cities in China.[20] We extract key information, including the procurement government, the project/goods involved, the vendor's identity, purchase amount, and prices. We construct a company-by-year panel dataset by summing the total government procurements for the firm in the specific year. Although a firm has 1.7 procurement contracts over the 7-year sample period (2013-2019) on average, firms rarely receive multiple contracts from the government in one year. In those very rare cases that one firm receives contracts from multiple governments, we use the feature of the government with the largest procurement contract amount when studying contract heterogeneity.

Second, government debt data comes from the Wind database. We collect data on both ways that Chinese local governments raise debt. The first one is to issue local government bonds directly. However, Chinese local governments were not allowed to issue bonds directly until 2014, when the central government passed rules designed to make local government debt more transparent. The second way is to borrow through LGFVs. This is the primary method to raise external finance for local government. The LGFVs can issue bonds in the market or take interest-bearing loans from banks. Panel A of Figure A.1 shows the stock of each type of debt over our sample period from 2014 to 2019. For the local government bonds and MCBs, we obtain the relevant information regarding the date of issuance, identity of the issuer, maturity date, total amount, and coupon rate. While the bond issued by LGFVs like municipal corporate bonds (MCBs) are open to the market, the loan and other interest-bearing debt are relatively harder to track. We identify all MCB issuers and extract their debt information from financial statements from the Wind database[21]. Most LGFVs are not listed companies, so they announce

[20] The procurement law setting up the publicly available data set for procurements was implemented in 2014, and the procurement announcements before 2013 are not standardized in format and are fewer in number. However, its impact on our merged database is limited as most firm-level information is only available after 2014.

[21] The name list of LGFVs comes from the Wind database. We also compare our LGFV bond repayment with a recent Chinese paper that proposes a more accurate definition of LGFVs (Xu et al., 2020), and the correlation between our measure and theirs is 0.96.

financial statements only when they issue bonds. The MCB issuers are estimated to cover more than 70% of all LGFVs. We then measure the total debt of local governments by the total amount of debt that needs repaying that year, by summing up 1) the maturing amount of local government bonds and municipal corporate bonds, 2) the interest payment of outstanding bonds, and 3) other interest-bearing debt of LGFVs, including short-term loans, account payables, and long-term debt to be mature in one year. Panel B of Figure A.1 shows that although there was a substantial increase in the local government bond recently, the maturing debts are mostly MCBs and LGFV debts.[22]

Third, data on financial statements of public suppliers are from Oriana, the Asia Pacific company information from Bureau van Dijk, a Moody's Analytics Company.[23] The data include information on public and private companies and are primarily consolidated from original filings to regulatory agencies, which include a company's directors and contracts, corporate structures, financial statement variables. Although not all financial statement information is available, we rely on the headline financial statement information, for which data are more readily available. We obtained basic information and shareholder profiles of approximately 2 million companies in China from 2009 to 2019. We only keep companies with at least three years of complete financial information and winsorize total assets at the 5% level to avoid skewing our results by extreme value observations. We end up with 2,783,374 observations from 997,024 companies.

Last, we obtain local protests data from China Labor Bulletin (CLB), a Hong Kong-based non-governmental organization. It collects and continuously updates a database of collective actions in mainland China since 2010. The database contains the most exhaustive collection of local protest incidents in China that have ever appeared in the media, including some that were deleted afterward. The main sources of information are mainstream social media in mainland China, such as Weibo (China's equivalent of Twitter), WeChat subscription account, and Tianya

[22] The State Council initiated a debt-swapping plan in 2015 where they issue new government bonds to replace the outstanding MCBs to make government debt more transparent. The reform does not affect our measure because 1) both types of bonds are government liabilities that we take into account, and 2) researches show that implicit government guarantee to LGFVs still exists after the policy implementation, especially among MCBs maturing during 2015-2018 (Jin et al., 2022; Zhong et al., 2021), which takes up the majority of our sample.
[23] The dataset belongs to the same company as the global Orbis database, which is also a Bureau Van Dijk Moody's Analytics Company. This dataset was shown by (Kalemli-Ozcan et al. 2015) to permit the construction of a nationally representative sample compared to aggregate Eurostat statistics.

Forum, etc, as well as some official media coverage. During our sample period from 2013 to 2019, there are a total of 11,799 incidents covering 357 cities, of which 8,575 incidents involved wage arrears. In the remaining situations, employees demand pay raises, pension benefits, or improved working conditions. Where available, the database provides detailed information about each event, including its date, the city where it happened, the companies involved, the cause, as well as the type of action, the size of the personnel, and the official response. The majority of the companies involved were in the manufacturing (24.57%), service (16.41%), and construction (48.72%) sectors that actively hire migrant workers. These collective activities often involve less than 100 participants and take the form of protests, processions, displaying banners, and requests for the intervention of labor justice and other authorities.

We merge the three databases using the firm identities and city names and obtain 13,866 supplier firms from 231 cities with complete financial information and with 110 protest records concerning 69 firms[24]. The sample covers 46,549 firm-year observations. Table A.1 shows the definition of all variables, and Table 1 shows the summary statistics.

4. Empirical Analyses

4.1 Empirical Specification

We estimate a regression specification of the form:

$$y_{i,t} = \beta 1[\text{Gov. supplier}]_{it} \times 1[\text{High pressure}]_{it} + X'_{i,t-1}\Gamma + \alpha_{j(i),t} + \mu_c + \rho_t + \varepsilon_{i,t},$$

where i indexes a firm, and t indexes a year. The outcome variables $y_{i,t}$ are firm characteristics. In the baseline regression, the outcome variable is the account receivables scaled by past total assets. In later sections, we explore other firm characteristics, e.g. its cash-

[24] When matching firms involved in local protests (CLB firms) with supplier firms, we conduct fuzzy matching based on company name. This is because these names are mainly from social media, and the post may not include the full name as the firm is registered or only refer to a branch. For example, China Guanghui Development Co., Ltd. may appear in the CLB database as "Guanghui Company" or "Beijing Guanghui Branch". The process of fuzzy matching is as follows: First, according to the naming convention of "region" + "keyword" that most Chinese companies follow, we remove the region or city in the name of each CLB firm. Next, we search in our supplier database for the first three Chinese characters of CLB firm names. Then, we manually check the matching results and keep the most reasonable one (if any) for each CLB firm. Finally, for supplier firms that match multiple CLB firms, we aggregate the number of protest events.

holding, investment, and R&D expenditure, as well as the number of firm-related protests. We cluster standard errors by the firm.

Our main variable of interest is the interaction between the $1[\text{Gov. supplier}]_{it}$ and $1[\text{High pressure}]_{it}$. $1[\text{Gov. supplier}]_{it}$ is a dummy variable that is 0 before the firm becomes a government supplier and 1 after a firm becomes a government supplier. $1[\text{High pressure}]_{it}$ is a dummy variable that equals 1 if the government has a higher-than-median local government debt-to-income ratio compared to others within the same year.[25] The definition of $1[\text{High pressure}]_{it}$ is based on the comparison to the median of government observations of the same year to avoid overweighting observations from later years in our sample since the debt has risen across the board. $X_{i,t-1}$ is a set of time-varying firm characteristics, including firms' total asset, leverage ratio, profitability, and tangibility. $\alpha_{j(i),t}$ denotes industry-by-year fixed effects. Time-invariant features of cities and annual macroeconomic conditions affecting all firms are absorbed by city fixed effects μ_c and year fixed effects ρ_t, respectively.

4.2 Trickle-Down Effect of Local Government Debt

4.2.1 Government Suppliers

We first examine whether the local government can pass their debt pressure to their local suppliers. Table 2 shows the baseline results on the firm financials. In Column (1), the coefficient of the interactive term between the $1[\text{Supplier}]_{it}$ and $1[\text{High pressure}]_{it}$ is positive and significant, meaning that once firms become suppliers of a highly indebted local government, they subsequently see higher account receivables compared to other firms in the same industry that became a supplier of a less indebted government around the same time. The point estimate suggests that suppliers to an indebted government are associated with 6.7 million RMB (approx. 1 million USD) of additional account receivables after the contract is signed. This is economically meaningful, as it accounts for 23.2% of the total value of the average amount of government procurement (of 25.3 million RMB). In other words, the local government in debt may pass the debt pressure by delaying their promised payments to private

[25] Government income includes both income from taxation and extra-tax income, mostly from the sale or leasing of land.

firms.

From Columns (2) onwards, we show that the high account receivables may cause serious liquidity problems for those suppliers. This is mainly reflected in the reduction in the amount of cash available to them. Consistent with this hypothesis, we find the suppliers of these indebted governments had a very significant decrease in their cash levels. The lack of internal financing due to the exogenous shock is likely to have a real impact on firms' behaviors, considering most firms in China lack sufficient external financial means. (Poncet, 2010, Cull et al, 2015) We find that those affected suppliers are associated with a slower growth rate in their fixed assets, suggesting that they are delaying their investments. Their research and development expenditures are also declining further, suggesting that firms are sacrificing their innovation potential to stay survive when liquidity is low. Column (5) also shows a decrease in firms' ROE by 20% compared to the sample average, indicating that the liquidity shortage has a major impact on the firm's overall profitability.

Figure 1 also shows that high government indebtedness is not related to firms' accounts receivable before the firm becomes the government's supplier. On the other hand, the firms' accounts receivable would increase with the local government's indebtedness after they become the supplier and only when the government pressure is severe, i.e. more than 50% of local government income is forced to repay debt.

We consider several robustness tests that address the concern that the rapid rise in account receivables for indebted government suppliers may be related to several factors. Panel A of Table A.2 shows the following results. First, these accounts receivable are likely elevated because government projects are not yet finished and thus unpaid. We find that controlling for the contract end date has little effect on the results. Second, some companies may have multiple government projects of a similar nature. This can cause our AR calculations to be inaccurate and simply reflect repeated procurements. We, therefore, consider companies that have only one government order. Our results persist.

Third, our results may be driven by the efficiency of the government, which may be negatively impacted by the anti-corruption investigations which happened in our sample. For example, Germaschewski et al. (2021) find that augmenting a real business cycle model with government expenditures and expropriations generates predictions close to Chinese

macroeconomic data. Notably, the explanatory power of expropriation drops after 2012, coinciding with the government's anti-corruption campaign. It could be because officials are being investigated and punished causing a shortage of staff, or it could be because the anti-corruption has made many officials fearful and reluctant to work. However, dropping the anti-corruption period from our sample does not change our results.

Fourth, we also consider whether the company's accounts receivable represents delayed payments or simply accrual accounting through the booking of more anticipated revenues. Specifically, we looked at companies that might be manipulating accruals by focusing on those with sister companies who may be more likely to manipulate their AR and find quantitatively similar results.

Finally, to avoid conflating local government debt of different levels from city to provinces, we also consider including only municipality-level government in our sample, and the point estimate remains similar level.

Additional tests reveal our results are also not driven by outliers or specific contract features. Changing the definition of an indebted government threshold also does not appear to materially affect our results. Additional robustness tests using different measures of government indebtedness are shown in Table A.3, including both a quantity-based and price-based measure: (1) an absolute cut-off of 100% of fiscal income and (2) the government issues bond with higher than median interest spread to capture the possible deterioration of the debt issuer's credit rating and the associated rollover risks even when the total scale of debt is not large.

Altogether, this set of additional tests corroborate our interpretation that suppliers to more indebted governments appear to provide more short-term financing for governments compared to those supplying to less indebted governments.

4.2.1 Government Supplier's Suppliers

In Table 3, we test whether there appears to be further transmission of the local debt pressure to focal firms' suppliers. We find that focal firms' account payables also rise, suggesting that perhaps distressed government suppliers can also delay their payment to their own suppliers. However, the net accounts receivable, the total account receivable minus the

account payable, still increases. This set of results suggest that any trade credit finance they manage to obtain from their suppliers is insufficient to compensate for their liquidity loss due to delayed payment from the government. The estimates suggest firms manage to split half of the debt pressure to their suppliers through accounts payable and retain the other half on their balance sheets.

If the increase of the account payable represents a deterioration in firms' working capital conditions, we expect an increase in litigation by creditors demanding payments. Litigation is necessary for the creditors to liquidate the asset of the defaulted borrower, and all the litigation information is included in the judicial database of China (Franks et al., 2021). We find in Column (3) of Table 3 that the probability of government suppliers were litigated was significantly higher after they accumulated high account receivables, suggesting that the firms are more likely to default on their loans due to the exhaust of internal funding and operational cash. The results suggest the increase in accounts payable is likely the consequence of firms' low liquidity rather than other factors such as enhanced bargaining power or a rise in sales.

4.3 Social unrest

But no only may affected firms delay payments to suppliers, firms becoming financially distressed due to delays in government payments may also delay wage payments to their employees (Aziz and Cui, 2007). Since workers have no legal recourse on workers, they may look for alternate solutions. One potentially dangerous but effective one is protesting. Local government authorities are more inclined to respond to the protests of unpaid workers since social unrest can affect the local government officials' political career. Although most protest material in the media is promptly censored, protests are more likely to be responded to if they are covered by specific major media. The local administration generally responds to about 6% of all protests. On the other hand, local police may choose to suppress the protests, in which case the protesters risk being detained. However, it does not serve as a significant deterrent for desperate peasant workers who are awaiting payment.

In Table 4, we explore the likelihood of employees taking to the streets in protest after the government default on their employer. We find that the likelihood of supplier's employee protest increases by around 0.2% for the indebted government compared with the non-indebted

government.[26] The result is unchanged when controlling for a series of firm-related characteristics, such as the total asset and leverage ratio. The results stand all robustness tests we mentioned above, as shown in Panel B of Appendix Tables 2 and 3.

To mitigate the concern that the OLS results could just capture the certain established trend of dry-out of supplier's liquidity, we draw figures for the three main variables, the suppliers' accounts receivable, cash ratio, and the probability that they are involved in wage-related protests, against years before and after they obtain government procurements. The point estimates reported in Figure 2 suggest that there is no established trend before the firm becomes the supplier.

Finally, to ensure that certain outliers do not drive our results, we decompose the government into quartiles according to their respective government pressures. If the high pressure drives the delay in repayment, one would expect to see a monotonically increasing effect over the supplier's account receivables as well as the probability of protest across local government debt-to-income quartiles: Those governments with the highest (lowest) High pressure should be associated with the largest (smallest) local firms' account receivables. This conjecture is supported in Table 5. The coefficient of the most indebted government is the highest, followed by the coefficient of the less indebted governments.

4.4 Endogeneity and Confounding Factors

There are two main sources of endogeneity in our analyses: variables confounding government indebtedness and the selection of firms to becoming government suppliers.

4.4.1. Local Factors

The increased indebtedness of the local government and the increase in local protests may both be the result of certain local conditions, notably the economic slowdown. We try to address this concern in the following ways. First, we construct dummy variables indicating whether the city has higher than median GDP growth. Second, we consider if the city has higher than median fiscal expenditure. Columns (1)-(2) in Table 6 show that for either case, the coefficient of the interaction of include the interaction between the dummy variables, 1[Gov.

[26] Regression results shown in Table A.5 also suggest a positive correlation between government indebtedness and the probability of local protests.

Supplier], and 1[High pressure] is not significant, suggesting that the local economic condition may not be the main driver of our result. Moreover, adding this interaction does not change our main result in the main coefficient on the interaction of 1[Gov. Supplier] and 1[High pressure].

Second, we use the subsample of those suppliers whose headquarters is not in the local city which they contract in. These suppliers are less likely to be affected by local economic conditions, such as GDP and government expenditure (except through the government contract directly – our main channel). If our baseline estimates were driven by certain local economic factors, we would expect that the effect is smaller for these non-local firms. However, we find that the estimated coefficient is even larger than our baseline specification. Therefore, rather than being consistent with confounding local variables, the evidence is more consistent with local governments expropriating non-local suppliers even more, as they have lower political and economic power compared to local firms.

We also consider a placebo test looking at non-wage-related protests. Compared with protests where protestors are demanding the government or employers to pay wages, those protests not related to protests, such as demand for higher benefits, lower inflation, or certain regulation over working environments, are more likely to be related to local economic factors instead of related to high government debts. Column (3) of Table 6 studying these other protests shows no relation between high government indebtedness and being a government supplier, suggesting that our results are not entirely driven by these other local variables.

4.4.2. Selection of Supplier Firms

The second type of endogeneity is that those suppliers of indebted government are highly selected, and their inherent differences from other firms may be the reason for their employees' protests. For example, firms signing up to be suppliers of highly indebted governments might be expanding aggressively and overworking their employees to do so. Therefore, we directly account for recent firm growth in our empirical specifications. We define an expanding firm dummy that equals 1 if the firm's recent sales growth is higher than the median level in the year, and then interact this expanding firm dummy with the $1[\text{Supplier}]_{it}$ and $1[\text{High pressure}]_{it}$ interaction. Column (1) of Table 7 shows that firms with high recent expansion are not differentially associated with higher protests.

Second, suppliers of indebted governments may be different from suppliers of the non-indebted government along unobservable time-varying characteristics. For instance, the government may grant procurement contracts to those firms according to certain soft information: such as those with the greatest expansion potential. We therefore follow Beraja et al. (2022) to construct a firm index and a contract index, to control for hidden factors that may affect the matching of firms with local governments. We proxy for firms' annual index using their establishment year, size, leverage, and shareholder composition prior to becoming a government supplier. We also calculate the contract index using its type, term, and total amount. After controlling for the two indexes in our regression (Column (2)-(3) of Table 7), our main result is also unchanged. This alleviates the concern that our results are driven by certain features of the suppliers and the contracts.

Finally, we exclude this possibility with the firm that has been the government supplier before the government becomes indebted. One would expect that those suppliers that sustained a long relationship with the local government are less likely to be subject to the selection problem. Column (4) of Table 7 uses the subsample of such firms, and shows that the coefficient of $1[\text{High pressure}]_{it}$ is still robust, suggesting that the selection issue may not be a major one either.

4.4.3. Instrumental variable approach

Because local governments may issue more debt when they believe future growth prospects are good, our baseline estimates may underestimate the true trickle-down effects of government debt. To mitigate this endogeneity concern, we use an instrumental variable regression. In particular, we follow Huang et al. (2020) to use the local political connection $1[\text{Top leader connection by hometown}]_{it}$ as the instrument, defined as 1 if the city is the hometown of any top national leader (above ministry level)[27]. The instrumental variable isolates the variation of government debt maturing in a particular year with a measure based on whether the top leader was born in that particular hometown before decades. The instrument

[27] We also follow Ru (2018) and use whether the local officials are in their first two years in office as another instrument variable. When local officials first take office, they are more motivated to take economic-stimulating policies to maximize their promotion probability, most of which are financed by local government debts, thus increasing local government indebtedness. The instrument generates similar results.

is relevant because connected cities are more able to push for projects financed with government debt due to favors from the central government. The exclusive restriction condition is also plausibly satisfied, as a city's political connections are not directly related to economic conditions and protests of local employees.

Table 8 shows the estimation results. In the first stage regression, we find that top leader connections matter for debt accumulation. Being the hometown of top leaders is associated with significantly high local debt. In the second stage, we find that government indebtedness significantly impacts a firm's accounts receivable, as well as the probability of wage-related protests. Both coefficient scales are more than twice the OLS ones, suggesting that the endogeneity issue in the OLS regression may work against us by bringing down the coefficient. It could be the case that local firms, expecting that an indebted government may delay its payment for procurement contracts, would be more discreet in bidding and seek more protective terms like a higher prepayment in their contracts. This means that our result is underestimated due to the discreet business conduct of private firms. By bringing in exogenous shocks to local government indebtedness, the instrumental variable regression ignores this possibility and therefore yields higher coefficients.

5. Economic Mechanisms

We consider two competing economic mechanisms to explore how the debt pressure is trickled down from the local government to its suppliers and then to their employees, causing local protests: quid pro quo, or local government expropriation.

5.1 Quid Pro Quo

Firstly, local firms may be willing to provide the local government with trade credit even in the threat of local protests because they get other benefits in return. In this case, those firms with lower costs of capital are more likely to help the government, as those highly indebted local governments may be so loathed by the financial market to justify an interest rate higher than the private firms.[28] We proxy for firms' cost of capital with the industry's average

[28] There is some anecdotal evidence that suggests that the real cost of capital government debts could be significantly higher than the interest rate on paper, especially for those governments with small fiscal income. It

financing cost measured by interest expense to total debt. We would expect firms with high costs of capital should be less likely to engage in trade credit injection to the government. However, column (1) in Panel A of Table 9 suggests that firms with high costs of capital suppliers do not see any differential changes in their probability to protest compared to those with lower capital costs. Therefore, a firm's strategic financing of local governments due to their differential cost of capital unlikely leads to our results.

In addition, the provision of trade credit to indebted local governments could be the reciprocal behavior from the supplier's side to the government's favoritism (Compte et al., 2005; Ishii, 2009). We explore the several plausible ways a government can help a firm: granting more procurement contracts, reducing its taxes, or offering more land purchasing. The government may be more likely to grant more contracts to its favored firms even if others submit more competitive bids (Goldman et al., 2008). Governments can often exclude competing bidders by placing special requirements on their purchases so that their preferred firms are the only ones that meet the criteria. Alternatively, the government also has discretionary power in determining the taxes that a firm needs to hand in and may grant more taxation exemption to its favored firms.[29] The government may also choose to return the favor by using land sales to the firm to repay its financial debt. We address these potential reciprocities by collecting information on procurement contracts, the tax expense as well as the land purchase of the supplier, and regress them on $1[\text{Supplier}]_{it}$ and $1[\text{High pressure}]_{it}$ variables. Panel B of Table 9 reports the results of the analyses and fails to detect a significant effect for these favored government treatments, suggesting that the reciprocal behavior of the firms does not drive the results.

5.2 The Expropriation Channel

We explore whether the expropriation of the local government causes the effect. Local

is estimated that the local government's interest rate could be as high as 10%. See https://www.reuters.com/article/china-local-debt-snowball-fin-cost-idCNCNE95201X20130603. In one extreme case, one district government issue debt with an interest rate of 15% to its employees. See http://www.jsthinktank.com/jiangsuzhiku/cjcyjjyjy/news/201706/t20170607_4196168.shtml.

[29] For instance, in a very influential paper, Li et al, (2008) suggest that firms connected to local governments enjoy a significant higher level of tax exemptions than unconnected firms, illustrating the great discretionary power of Chines local government in determining the local firms' tax exemptions.

firms may be forced to provide subsidies to the local government because the government may refuse to pay the procurement on time after delivering goods and projects. There is no judicial remedy available to force the local government as all courts in China are affiliated with the government. As a result, the local firms may be forced to accumulate high account receivables, not able to pay their workers, and result in an increased probability of protests. We test this hypothesis by exploring heterogeneity both in firms and in the local government's intention of expropriation.

First, we define a dummy variable indicating that the suppliers' procurement contract value is greater, and thus face more severe liquidity shock when they are delayed payment. Column (2) of Panel A in Table 9 shows such firms have a higher probability of becoming the subject of protests after supplying to indebted governments.

Second, we use an ETC index of local government corruption following Cai et al. (2011) to measure to what extent the local government officials extort private firms without any checks and balances. Column (3) shows that regions with lower levels of property rights are associated with higher increases in the probability of protest. Similarly, we explore the effect on politically-connected firms, because those with government officials on their board are likely to renegotiate with the government. Column (4) shows that the probability that workers from these firms go on protest related to wage payment is much lower. This result indicates that local governments' delay in repayment is selective and may follow a kind of pecking order, prioritizing firms with more bargaining power and strategic importance based on the Communist Party's designation and disproportionately hurting smaller firms with less bargaining power. In addition, employee protections mitigate the effect of supplying to indebted governments on the probability of protests. We measure labor protection with the marketization index by Fan et al (2018). Column (5) in Panel A of Table 9 shows that regions with better labor protection are associated with a lower effect.

Lastly, trickle down effect is more severe for firms with less liquidity. Column (6) shows that firms with negative working capital before the indebted government's payment delays see more employee protests, corroborating our interpretation that the liquidity of local suppliers drives local demonstrations pertaining to wage non-payments.

These results suggest that the firms' provision of trade credit and higher possibility of

protests may not be its choice but an outcome imposed by the local government. These heterogeneous effects are particularly concerning as the smallest and weakest firms and their workers appear the most extorted.[30]

5.3 Hard-to-Detect Government Debt & Rollover Risks

Having confirmed that the growth in accounts receivable and the increase in protests were due to expropriation by the local government, an intuitive question remains: Why would the supplier firms agree to contract with the governments? We provide one possible explanation that these companies are not aware that the government is under high debt pressure. There are two major sources of local government debt, the government's bonds and the LGFV's debt, which includes municipal bonds and other debt such as bank loans that need to be found in their financial statements. The latter is very difficult to detect. For normal non-financial firms, it is already difficult for them to link LGFV's debt to government pressure, not to mention understand the financial information. The opaqueness of government debt prevents the suppliers from understanding the actual debt situation of the government and thus anticipating that the debt pressure may be transferred to them. We confirm the explanation in Table A.6 by separating debt pressure from LGFV and non-bond debt and show that our results are more pronounced when the pressure mostly comes from hidden debt.

We conduct further analysis to study where government rollover risks affect our results. We decompose the government debt pressure as either interest-driven or principal-driven and expect the interest-driven debt will exert a larger impact for two reasons. First, it is unlikely that local governments issue new debt to repay interest. Second, the interest burden reflects the financing costs of local governments, thus representing their rollover risk. In our sample, 4% (13% conditional on high pressure) local governments have higher than median total debt level driven by merely interest payment and the average interest cost to fiscal income ratio 6.91%with a median of 4.91%. Column (1) of Table A.4 shows that the debt pressure driven by interest will increase account receivables by about 3%, which is nearly 1% higher than the pressure driven by the principal. This suggests that indebted governments with less roll-over

[30] These latter results also further contradict the hypothesis that firms supply credit to governments due to their lower capital costs as smaller firms likely have higher costs of capital.

ability have a larger effect on their suppliers, corroborating our interpretation of cashflow constraints on local governments.

6. Discussion on Protests and Conclusion

6.1. Employee Characteristics & Collective Action

The central government's top priority is social stability. Local government authorities are more inclined to respond to the protests of unpaid workers before things get out of control since local collective action might affect promotions. Although most protest material in the media is promptly censored, protests are more likely to be responded to if they are covered by specific major media. The local administration generally responds to about 6% of all protests. On the other hand, local police may choose to suppress the protests, in which case the protesters risk being detained. However, it does not serve as a significant deterrent for desperate peasant workers who are awaiting payment.

We conclude our study by exploring what facilitates the local employees to organize a protest. In Table 10, we discuss features of protestors in several aspects: Firstly, anecdotal evidence shows that a large share of rural workers in the unskilled labor-intensive industry, such as construction and manufacturing, would fall victim to wage delay and they are more likely to protest. We use the average product complexity index from The Growth Lab at Harvard University (2019) to proxy task complexity in each industry and show that those workers doing less complex work are more likely to organize protests. Meanwhile, there is a higher probability of protests in cities with a higher proportion of workers in agricultural and industrial firms. Next, the literature emphasizes the importance of coordination to overcome the free-riding problem associated with protests (Passarelli and Tabellini, 2013; Bai and Jia, 2016). As the benefits of participating in the protests grow with the number of participants, more social links from the workplace or family ties increase the probability of protests.

Our results in columns (5)-(6) of Table 10 show that firms with a large employee population are more likely to experience protests, as it is much easier to organize a protest within one firm than across different firms. We also obtain the number of local clans from the Clan Culture Database, which summarizes all family ties from the General Catalog of Chinese

Genealogy, and find that regions with stronger family ties are more likely to experience local protests, suggesting the role of social capital in facilitating group actions.

6.2. Government learning from past unrests and strategic default

The analysis so far has discussed the potential consequences of the government delaying payment to enterprises. The next question is whether the local governments will further alter their delay behavior if they anticipate the resulting collective actions that may affect local stability. If the governments learn from the past unrests about the likelihood of future unrests, we conjecture that the governments will be less likely to delay payments to firms that have experienced unrests in the past, in order to minimize the negative impact of their default on suppliers. We further test this governmental learning behavior and their trade-offs between fiscal and stability pressures with the following regression:

$$y_{i,t} = \beta_1 1[\text{Gov. supplier}]_{it} + \beta_2 1[\text{Gov. supplier}]_{it} \times 1[\text{Past unrest}]_{it} + X'_{i,t-1}\Gamma + \alpha_{j(i),t} + \mu_c + \rho_t + \varepsilon_{i,t},$$

where $1[\text{Past unrest}]_{it}$ refers to whether enterprise i had any unrests related to wage arrears within the past three years. Other variable definitions are consistent with the baseline section. If the hypothesis is valid, we expect the coefficient β_2 to be negative.

Table 11 reports the estimated results of the above regression. The estimated coefficient indicates that while becoming a government supplier increases the firms accounts receivables, the effect is moderated if the firm had previous collective actions. This suggests that the government does indeed consider potential unrest consequences and choose to default strategically.

The result implies that the government's delay behavior considers multiple factors, and within the framework of this analysis, they may face trade-offs between political costs and fiscal constraints. The probability of collective action may provide a political cost channel that is distinct from fiscal pressure channel and that affects the repayment decisions of local governments. To analyze the relationship between these two channels, we add interaction terms representing government fiscal pressure in Columns (2) and (3). The results show that both channels are valid: the coefficients of adding both interaction terms are not significantly different from those of adding a single interaction term, indicating relative independence

between the two channels: on one hand, government fiscal pressure increases its delay of payments to enterprises; on the other hand, the government needs to consider the potential threat of collective action.

In reality, collective actions by the public often serves as the last resort to change government attitudes and behaviors. The results of this section provide possible evidence that Chinese enterprises and citizens have used collective actions to force the government to cease its expropriation of the private sector during the procurement process.

6.3. Conclusion

We show that firms supplying to indebted governments face payment backlogs that predict future liquidations and lower future firm growth. Corroborating the extant empirical literature documenting the crowding-in effect of government spending on research and development (e.g., Beraja et al. 2022), we show evidence suggesting that financial hardships lead governments to delay procurement contract payments also cause a negative externality to local non-government-linked firms. Deteriorating financial conditions at non-state-linked government suppliers are associated with protests on non-payment of wages and pensions, highlighting a social cost of government debt resulting from the trickling down of indebtedness to firms.

We also document that local governments in China appear to prioritize payments for contracts most aligned with the federal government's objectives and those with more bargaining power and delaying payments more for those where local governments appear stronger relative to firms, highlighting the importance of fundamental institutions such as the enforcement of property rights and an independent judiciary.

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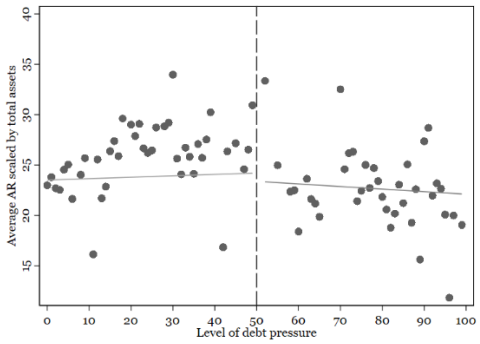
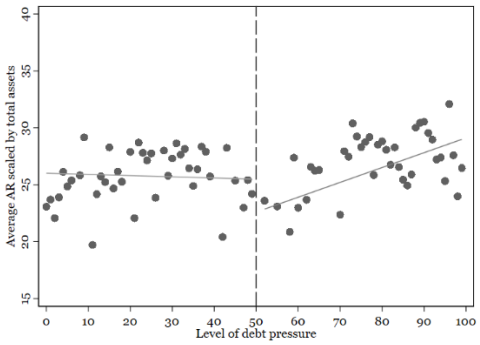
Tables and Figures

Figure 1. Fitted value of debt pressure and firm account receivables.

This figure presents the correlation between local government debt pressure and firms' account receivables. The x-axis is the level of government debt pressure measured by the debt to repay as the share of the local government fiscal income and is sorted into 100 groups. The y-axis is the average account receivable for firms with government procurement contracts.



Panel A. Pre-supply, two fitted lines.

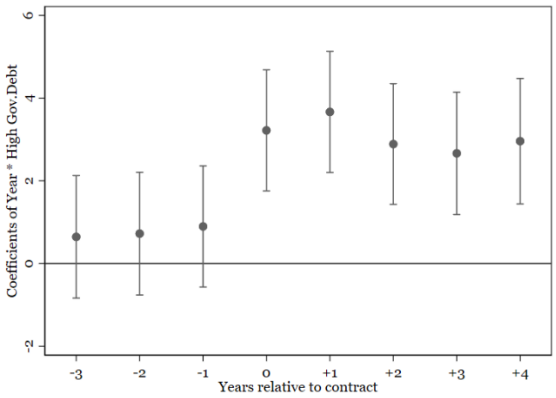


Panel B. Post-supply, two fitted lines.

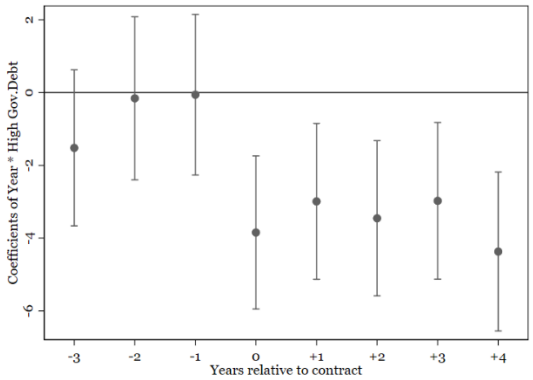
Figure 2. Dynamics of trickle-down and local protests

This figure presents the coefficients of the interaction between 1[High pressure] and the number of years relative to supplying to local government. The dependent variables for Panels A-C are account receivables, cash ratio, and the probability of protests, respectively.

Panel A. Accounts receivables



Panel B. Cash ratio



Panel C. Probability of protests

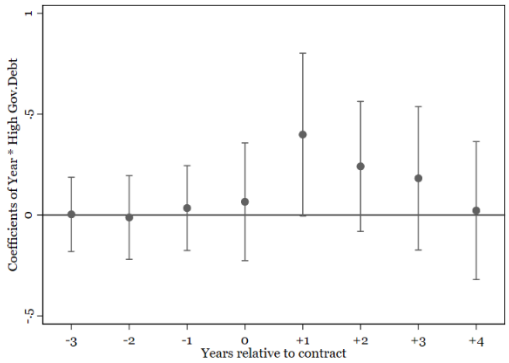


Table 1. Summary Statistics

This table shows the summary statistics of the main variables in this study. The sample comprises 46,549 firm-year observations.

Variables:	Mean	Std. dev	P25	Median	P75
Panel A. Key variables					
Account receivable	24.962	20.236	8.986	20.767	36.533
1[Protest]	0.180	4.244	0	0	0
1[Gov. supplier]	0.787	0.409	1	1	1
1[High pressure]	0.322	0.467	0	0	1
Debt pressure (% of fiscal income)	72.573	89.367	11.213	50.782	90.790
Panel B. Firm characteristics					
Cash	21.337	20.488	6.497	14.797	29.327
Fixed assets growth	-0.349	28.138	-0.007	0.000	0.07
R&D expense	1.817	5.300	0.000	0.000	0.000
ROE	6.926	42.951	0.46	5.63	16.01
Account payable	17.39	18.683	2.672	11.528	25.965
Net account receivable	7.572	22.876	-3.391	5.253	19.557
1[Ligitation]	0.851	9.184	0	0	0
Tangible asset	17.359	19.552	2.115	9.49	27.533
Asset turnover	127.829	184.991	51.707	89.489	152.732
Leverage ratio	50.989	26.629	30.241	52.605	72.946
ROA	3.636	10.109	0.19	2.04	6.65
Total assets	1124.73	4021.82	13.269	60.091	328.983
1[Firms expanding]	0.169	0.374	0	0	0
1[Other city]	0.584	0.493	0	1	1
Financing cost	0.001	0.001	0	0	0.001
External-finance dependence	0.196	3.298	-2.104	0.137	1.248
1[Connected]	0.001	0.038	0	0	0
Employment	546.67	2543.78	10	10	100
1[Multiple contracts]	0.27	0.44	0	0	1
Number of contract	1.582	1.336	1.00	1.00	2.00
1[Follow-up contract]	0.473	0.499	0	0	1
Tax expense	0.825	1.506	0.017	0.304	1.058
Number of land bought	0.004	0.602	0	0	0
Area of land bought	0.004	0.643	0	0	0
Panel C. Other characteristics					
1[High GDP]	0.414	0.493	0	0	1
1[High fiscal expenditure]	0.439	0.496	0	0	1
1[Top leader connection by hometown]	0.731	0.444	0	1	1
1[Poor labor protection]	0.656	0.475	0	1	1
1[Poor property right protection]	0.271	0.445	0	0	1
Task complexity	0.501	0.404	0.479	0.6	0.6
Percentage of lower-skill labor	40.161	11.632	40	40	40
Local clan	38.628	48.825	1	13	71

Table 2. Local debt pressure on suppliers' account receivables, liquidity and investment

This table reports regression coefficients of firms' financial characteristics on government supplier indicators. The account receivable and cash are scaled by total assets, and R&D expenses by total sales, and all dependent variables represented as percentages. Column (1) – (5) reports estimated coefficients of the interaction of the post-becoming supplier dummy and government high-debt pressure dummy with time-varying controls. Control variables include firm size, tangibility, leverage, and profitability ratios. All regressions include year, industry-year, and city fixed effects. Standard errors are clustered by the firm and are reported below the regression coefficients. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent variable:	Account receivable (% of Assets)	Cash (% of Assets)	Fixed assets growth (%)	R&D expense (% of Sales)	ROE (%)
	(1)	(2)	(3)	(4)	(5)
1[Gov. supplier]	0.132	0.171	-0.237	0.260*	-0.166
	(0.240)	(0.256)	(0.415)	(0.147)	(0.540)
1[High pressure]	-2.606***	1.487***	0.886	0.329	0.896
	(0.350)	(0.377)	(0.717)	(0.262)	(0.757)
1[Gov. supplier]×1[High pressure]	2.384***	-0.739*	-0.814	-0.546**	-1.530*
	(0.348)	(0.382)	(0.501)	(0.248)	(0.840)
Control	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Industry×Year FE	Yes	Yes	Yes	Yes	Yes
City FE	Yes	Yes	Yes	Yes	Yes
Observations	46,549	46,549	34,074	15,503	46,549
R^2	0.871	0.855	0.320	0.748	0.767

Table 3. Local debt pressure on suppliers: the ripple effect

This table reports further outcomes of becoming government supplier indicators. The account payable and net account receivable are scaled by total assets, and 1[Litigation] by 100. Column (1) – (3) reports estimated coefficients of the interaction of the post-becoming supplier dummy and government high-debt pressure dummy with time-varying controls. Control variables include firm size, tangibility, leverage, and profitability ratios. All regressions include year, industry-year, and city fixed effects. Standard errors are clustered by firm and are reported below the regression coefficients. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent variable:	Account payable	Net account receivable	1[Litigation] (%)
	(1)	(2)	(3)
1[Gov. supplier]	-0.368*	0.500*	0.011
	(0.196)	(0.287)	(0.022)
1[High pressure]	-0.667**	-1.939***	-0.307**
	(0.299)	(0.422)	(0.127)
1[Gov. supplier]×1[High pressure]	1.289***	1.095***	0.331**
	(0.303)	(0.425)	(0.136)
Control	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Industry×Year FE	Yes	Yes	Yes
City FE	Yes	Yes	Yes
Observations	46,549	46,549	46,549
R^2	0.884	0.846	0.985

Table 4. Local debt pressure on local protests

This table reports regression coefficients of the number of local protests related to government suppliers. The dependent variable is the dummy variable indicating whether there is local protests due to wage arrears and is scaled by 100. Column (1) reports estimated coefficients of the interaction of the post-becoming supplier dummy and government high debt pressure dummy with no controls. Column (2) adds firm characteristic controls. All regressions include year, industry-year, and city fixed effects. Standard errors are clustered by firm and are reported below the regression coefficients. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent variable:	1[Protest] (%)	
	(1)	(2)
1[Gov. supplier]	0.024	-0.005
	(0.081)	(0.082)
1[High pressure]	-0.130*	-0.120*
	(0.074)	(0.073)
1[Gov. supplier]×1[High pressure]	0.175*	0.189**
	(0.092)	(0.093)
Controls	No	Yes
Year FE	Yes	Yes
Industry×Year FE	Yes	Yes
City FE	Yes	Yes
Observations	46,549	46,549
R^2	0.014	0.018

Table 5. Local Government Indebtedness Intensity and Government Debt Type

This table reports the effect of different levels of government debt on firm's account receivables and related local protest. We create a quartile indicator on the degree of government pressure based on percentage of debt to fiscal income, with Q1 (Q4) indicating the smallest (greatest) government pressure. All regressions include control variables and year, industry-year and city fixed effects. Standard errors are clustered by firm and are reported below the regression coefficients. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent variable:	Account receivable	1[Protest] (%)
	(1)	(2)
1[Gov. supplier]×1[High pressure (25-50 percentile)]	-0.502	-0.005
	(0.573)	(0.139)
1[Gov. supplier]×1[High pressure (50-75 percentile)]	2.696***	0.182**
	(0.749)	(0.083)
1[Gov. supplier]×1[High pressure (75-100 percentile)]	5.423***	0.369***
	(0.787)	(0.117)
Control	Yes	Yes
Year FE	Yes	Yes
City FE	Yes	Yes
Industry×Year FE	Yes	Yes
Observations	46,549	46,549
R^2	0.161	0.019

Table 6. Endogenous concerns: Controlling for effects of local economy

This table reports the effect of different levels of government debt on the firm's account receivables and related local protest. We create a quartile indicator on the degree of government pressure based on the percentage of debt to fiscal income, with Q1 (Q4) indicating the smallest (greatest) government pressure. All regressions include control variables and year, industry-year, and city fixed effects. Standard errors are clustered by firm and are reported below the regression coefficients. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent variable:	1[Protest] (%)			1[Protest (non-wage)] (%)
Key indicator:	Local GDP growth	Local fiscal expenditure	Subsample: Government from different cities	
	(1)	(2)	(3)	(4)
1[Gov. supplier]×1[High pressure]	0.222*	0.250*	0.317**	-0.010
	(0.126)	(0.129)	(0.140)	(0.061)
1[Gov. supplier]×1[High pressure]×Local GDP growth	-0.083			
	(0.160)			
1[Gov. supplier]×1[High pressure]×local fiscal expenditure		-0.249		
		(0.166)		
Control	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
City FE	Yes	Yes	Yes	Yes
Industry×Year FE	Yes	Yes	Yes	Yes
Observations	46,549	46,549	27,201	46,549
R^2	0.018	0.019	0.027	0.004

Table 7. Endogenous concerns: Selection of supplier firms

This table addresses endogeneity concerns about the selection of supplier firms. Column (1) reports the coefficients of the interactions with the dummy variable indicating that firms have been expanding over the last years. Column (2) – (3) reports the coefficients when controlling for all the interactions between the firm index and the year dummy ($\sum_T T_t X_{it}$), and the interactions between the contract index and year dummy ($\sum_T T_t C_{it}$). Column (4) includes firms that have been suppliers during the whole sample period (i.e. before 2013). All regressions include year, industry-year, and city fixed effects. Standard errors are clustered by firm and are reported below the regression coefficients. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent variable:	1[Protest] (%)			
Key indicator:	1[Firms expanding]	Index_firm	Index_contract	Subsample: always suppliers
	(1)	(2)	(3)	(4)
1[Gov. supplier]×1[High pressure]	0.217**	0.165**	0.189**	0.159*
	(0.110)	(0.081)	(0.093)	(0.082)
1[Gov. supplier]×1[High pressure]×Key indicator	-0.162	0.199	0.042	
	(0.145)	(0.208)	(0.035)	
Control	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
City FE	Yes	Yes	Yes	Yes
Industry×Year FE	Yes	Yes	Yes	Yes
Observations	46,549	46,549	46,549	26,505
R^2	0.018	0.019	0.018	0.041

Table 8. 2SLS regressions: local leader as instrumental variable

This table shows the results with the instrument variable for local government debt pressure: the dummy variable indicating whether there are top national policy-makers (at the ministerial level or above) who were born in the city, following Huang et al. (2020). Column (1) shows 1st stage estimates, and columns (2)-(3) show 2nd stage results. All regressions include year, industry-year, and city fixed effects. Standard errors are clustered by firm and are reported below the regression coefficients. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	1st stage	2nd stage	
Dependent variable:	1[High pressure]	Account receivable	1[Protest]
	(1)	(2)	(2)
1[higher leader connection by hometown]	0.467***		
	(0.010)		
1[Gov. supplier]×1[High pressure]		6.166***	0.587*
		(1.357)	(0.339)
Control	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
City FE	Yes	Yes	Yes
Industry×Year FE	Yes	Yes	Yes
Observations	46,533	46,533	46,533
R^2	0.396	0.124	0.004
Cragg-Donald Wald F-stat	4,922		

Table 9. Mechanism analysis: Quid pro quo or expropriation

This table shows the results of the mechanism analysis. Panel A shows coefficients when controlling for various key indicators. Column (1) reports the coefficients with interaction terms with the industry's average financing cost. Column (2) includes the indicator showing whether the firm's sales rely on government contracts. Column (3)– (4) reports the coefficients when controlling for dummy variables indicating poor property right protection with ETC measure by Cai et al (2011), and whether the firm is politically connected, all represented in percentage points. Column (5) includes interaction terms with good labor protection based on the marketization index by Fan et al (2018). Column (6) includes the indicator showing the firm with less liquidity. Panel B explores the influence of other possible benefits enjoyed by the suppliers to justify its high account receivables as a return to the government's favors. We use the dummy variable indicating multiple contracts, the number of contracts, the indicator variable of any follow-up contracts, the taxation, as well as the natural logarithm of the number and area of land bought as proxies for the favorable treatment received by suppliers. All regressions include year, industry-year, and city fixed effects. Robust standard errors are reported below the regression coefficients. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A. Dependent variable: 1[Protest]						
Key indicator:	Average financing cost	1[Reliant on procurement]	1[Poor property rights]	1[Connected]	1[Good labor protection]	1[Illiquid]
	(1)	(2)	(3)	(4)	(5)	(6)
1[Gov. supplier]×1[High pressure]	0.296**	0.002	0.101	0.192***	0.258***	0.090
	(0.116)	(0.058)	(0.091)	(0.071)	(0.092)	(0.060)
1[Gov. supplier]×1[High pressure]×Key indicator	8.002	0.250**	0.808**	-1.196*	-0.311**	0.667**
	(49.780)	(0.108)	(0.411)	(0.615)	(0.127)	(0.317)
Control	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry×Year FE	Yes	Yes	Yes	Yes	Yes	Yes
City FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	25,237	46,549	22,979	46,549	46,549	46,549
R^2	0.026	0.019	0.023	0.019	0.019	0.019

Panel B. Potential favors to firms						
Dependent variable:	1[Multiple contracts]	Number of contracts	1[Follow-up contract]	Tax expense	Number of land bought	Area of land bought
	(1)	(2)	(3)	(4)	(5)	(6)
1[Gov. supplier]×1[High pressure]	-0.078***	-0.081***	0.014	-0.012	-0.000	-0.002
	(0.012)	(0.027)	(0.013)	(0.035)	(0.003)	(0.004)
Control	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE			Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry×Year FE	Yes	Yes	Yes	Yes	Yes	Yes
City FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	46,549	46,549	46,549	46,550	46,549	46,549
R^2	0.072	0.081	0.524	0.766	0.304	0.272

Table 10. Coordination of local protests

This table reports coefficient estimates about the coordinating cost of protests. We split the sample by 1) average product complexity within the industry, 2) the percentage of labor in 1st and 2nd industries, 3) the number of firm employers, and 4) the number of local family clans. All regressions include year, industry-year, and city fixed effects. Standard errors are clustered by firm and are reported below the regression coefficients. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent variable:	1[Protest] (%)							
Key indicator:	Task complexity		Percentage of labor in 1st and 2nd industries		Number of employments		Number of local clans	
	High	Low	High	Low	High	Low	High	Low
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1[Gov. supplier] ×1[High pressure]	0.271*	0.130	0.238*	0.138	0.384*	0.075	0.333**	0.037
	(0.156)	(0.090)	(0.130)	(0.108)	(0.224)	(0.055)	(0.168)	(0.112)
Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry×Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	27,475	19,074	9,507	37,042	15,971	30,578	21,823	24,726
R^2	0.030	0.027	0.048	0.021	0.028	0.029	0.019	0.023

Table 11. Government learning from past unrest

This table reports coefficient estimates about how governments learn from past unrests and strategically default on their suppliers. 1[previously having unrest] is the supplier had any unrests related to wage arrears within the past three years. All regressions include firm, year, industry-year, and city fixed effects. Standard errors are clustered by firm and are reported below the regression coefficients. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent variable:	Account receivable		
	(1)	(2)	(3)
1[Gov. supplier]	1.633***	0.966***	0.966***
	(0.245)	(0.262)	(0.262)
1[Gov. supplier] × 1[previously having unrest]	-13.873***	-14.148***	-13.316***
	(1.078)	(1.078)	(1.271)
1[Gov. supplier] × 1[High pressure]		2.111***	2.109***
		(0.401)	(0.401)
1[Gov. supplier] × 1[previously having unrest] × 1[High pressure]			-0.721
			(1.697)
Control	Yes	Yes	Yes
FE: Firm, Year, Industry x year, City	Yes	Yes	Yes
Observations	44,278	44,278	44,278
R2	0.884	0.885	0.885

A. Appendix

Table A.1 Variable Definition

Variables:	Description
Panel A. Key variables	
Account receivable	Firms' account receivables as % of total asset
1[Protest] (%)	1 if there is any local protest related to wage payment, scaled by 100
1[Gov. supplier]	1 after the firm became the supplier of the government
1[High pressure]	1 if either the maturing debt (% of fiscal income) or average spread is higher than the year median level of all city governments.
Debt pressure (% of fiscal income)	Maturing debt as % of local fiscal income.
Panel B. Firm characteristics	
Cash	Cash as % of total asset
Fixed assets growth	Growth rate of fixed assets
R&D expense	R&D expense as % of total sales
ROE	Return on equity
Account payable	Account payables as % of total asset
Net account receivable	Account receivables net of account payables as % of total asset
1[Ligitation]	100 if the firm being sued for not repaying
Tangible asset	Tangible asset as % of total asset
Asset turnover	Asset turnover, sales/tot.asset
Leverage ratio	Leverage ratio, debt/tot. asset
ROA	Return on assets
Total Assets	Total assets, in million RMB
1[Firms expanding]	1 if firm sales is growing more than 50%.
1[Other city]	1 if firm is supplier to the city other than where the firm is registered
Financing cost	Average interest cost of industry
External-finance dependence	Average capex not funded by operating funds of industry
1[Connected]	1 if the firm is politically-connected
Employment	Number of employees of the company
1[Multiple contracts]	1 if firm signed multiple contracts with government
Number of contract	Number of contracts
1[Follow-up contract]	1 if firm signed any follow-up contract after the one in the sample
Tax expense	Tax expense of firm, scaled by total assets
Number of land bought	Natural logarithm of number of land bought by the firm, scaled by 100

Area of land bought	Natural logarithm of area of land bought by the firm, scaled by 100

Panel C. Other characteristics	
1[High GDP]	1 if GDP growth rate is larger than sample median
1[High fiscal expenditure]	1 if fiscal expenditure (scaled by GDP) is larger than sample median
1[Top leader connection by hometown]	1 if the city is hometown to top national leader (above ministry level)
1[Poor labor protection]	1 if the labor factor liquidity component of property protection index by Fan et al.(2018) is lower than sample median
1[Poor property right protection]	1 if ETC cost of listed firms by Cai et al (2011) in the city is higher than sample median
Task complexity	Industry average task complexity index from Harvard ATLAS of Economic Complexity database. https://atlas.cid.harvard.edu/about-data
Percentage of lower-skill labor	Percentage of labor in non-service industries
Local clan	Number of family clans in the city

Table A.2 Robustness checks for alternative specifications

This table reports regression coefficients of a variety of robustness checks about the increase of firms' account receivables. The dependent variable of Panel A is the account receivable, and that of Panel B is the dummy variable indicating whether there is any protests related to wage payment. In Column (1) the firm is categorized as becoming a supplier only after the due time to finish the project or good delivery. In Column (2), we include suppliers with only one contract with the government contract throughout our sample period. In Column (3) we exclude those procurement contracts that finished during the local anti-corruption campaign period. In Column (4) we only include the sample of standalone firms that are affiliated with a corporation group. In Column (5) we exclude those procurement contracts with the provincial-level government. Control variables include firm size, tangibility, leverage, and profitability ratios. All regressions include year, industry-year, and city fixed effects. Standard errors are clustered by firm and are reported below the regression coefficients. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A. Dependent variable: Account receivable (% of Assets)

	1[Gov. supplier]: finished projects	Sample: Including only one procurement	Sample: excl. Anti corruption period	Sample: firms in a corporation group	Sample: municipality
	(1)	(2)	(3)	(4)	(5)
1[Gov. supplier]	2.379***	1.973***	2.430***	2.549***	1.951***
×1[High pressure]	(0.347)	(0.392)	(0.448)	(0.389)	(0.368)
Control	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Industry×Year FE	Yes	Yes	Yes	Yes	Yes
City FE	Yes	Yes	Yes	Yes	Yes
Observations	46,549	33,971	29,816	33,442	34,912
R^2	0.871	0.872	0.904	0.875	0.876

Panel B. Dependent variable: 1[Protests] (%)

	(1)	(2)	(3)	(4)	(5)
1[Gov. supplier]	0.189**	0.185*	0.185**	0.232*	0.210*
×1[High pressure]	(0.093)	(0.107)	(0.094)	(0.124)	(0.124)
Control	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Industry×Year FE	Yes	Yes	Yes	Yes	Yes
City FE	Yes	Yes	Yes	Yes	Yes
Observations	46,549	33,971	29,816	33,442	34,912
R^2	0.018	0.025	0.022	0.022	0.020

Table A.3 Robustness checks for debt pressure measures

This table reports regression coefficients of a variety of robustness checks about the measurement of government debt. The dependent variable of Panel A is the account receivable, and that of Panel B is the dummy variable indicating whether there is any protest related to wage payment. Column (1) defines 1[High pressure] as the debt level (scaled by fiscal income) being higher than 100. Columns (2)-(3) compare debt level and value-weighted average interest spread with the annual median. Column (4) use the absolute debt percentage to fiscal income. All regressions include year, industry-year, and city fixed effects. Standard errors are clustered by firm and are reported below the regression coefficients. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A. Dependent variable: Account receivable (% of Assets)

Definition:	1[Debt level>100%]	1[Debt level>median or Debt spread>median]	1[Debt level>median and Debt spread>median]	Debt level (% of Fiscal Income)
	(1)	(2)	(3)	(4)
1[Gov. supplier]	0.788***	0.124	0.809***	0.718***
	(0.224)	(0.257)	(0.217)	(0.256)
1[High pressure]	-0.847*	-1.967***	-0.835*	-0.004
	(0.435)	(0.303)	(0.503)	(0.003)
1[Gov. supplier]×1[High pressure]	0.931**	1.786***	1.282**	0.004
	(0.431)	(0.313)	(0.538)	(0.002)
Control	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Industry×Year FE	Yes	Yes	Yes	Yes
City FE	Yes	Yes	Yes	Yes
Observations	46,549	46,549	46,549	46,549
R^2	0.871	0.871	0.871	0.871

Panel B. Dependent variable: 1[Protest] (%)

	(1)	(2)	(3)	(4)
1[Gov. supplier]	0.010	-0.038	0.040	-0.047
	(0.068)	(0.096)	(0.063)	(0.077)
1[High pressure]	-0.248**	-0.126	-0.170**	-0.002***
	(0.103)	(0.088)	(0.069)	(0.001)
1[Gov. supplier]×1[High pressure]	0.376***	0.206**	0.276**	0.002***
	(0.116)	(0.103)	(0.133)	(0.001)
Control	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Industry×Year FE	Yes	Yes	Yes	Yes
City FE	Yes	Yes	Yes	Yes
Observations	46,549	46,549	46,549	46,549
R^2	0.019	0.018	0.018	0.019

Table A.4 Decomposing debt pressure: interest cost and principal payment

This table reports regression coefficients related to the interest or principal of local government debt. The dependent variables are account receivables and the dummy variable indicating whether there is any protest. We measure hidden debt with 1[High Pressure from Interest], which is defined as 1 if the percentage of LGFV debt interest to fiscal income is higher than the median of total debt level, and 0 otherwise. 1[High Pressure from Principal] is defined as 1 if 1) total debt level is higher than the median and 2) 1[High Pressure from Interest] is zero. All regressions include year, industry-year and city fixed effects. Standard errors are clustered by firm and are reported below the regression coefficients. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent variable:	AR	1[Unrest]
	(1)	(2)
1[Gov. supplier] ×1[High Pressure from Interest]	3.003***	-0.013
	(0.604)	(0.092)
	2.111***	0.255**
	(0.364)	(0.103)
Control	Yes	Yes
Firm FE	Yes	
Year FE	Yes	Yes
Industry x year FE	Yes	Yes
City FE	Yes	Yes
Observations	46,549	46,549
R^2	0.871	0.018

Table A.5 Local debt pressure and local protests: city level analysis

This table reports regression coefficients of the number of local protests related to local government debt. The dependent variable for columns (1)-(2) is the total number of local protests in the city, and for (3) - (4) the number of protests due to wage arrears. Column (2) and (4) includes control variables on local economic conditions. All regressions include year and city fixed effects. Standard errors are clustered by city and are reported below the regression coefficients. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent variable:	Total number of protests		Wage-related protest	
	(1)	(2)	(3)	(4)
1[High pressure]	1.218**	1.431***	0.713*	0.860**
	(0.515)	(0.539)	(0.382)	(0.372)
GDP		0.010		0.006
		(0.017)		(0.011)
Fiscal expenditure		0.870***		0.740***
		(0.194)		(0.110)
Population		-0.422*		-0.061
		(0.224)		(0.142)
Employment rate		-0.048		0.372
		(0.912)		(0.646)
Urban labor (%)		-0.667		-0.467
		(1.186)		(0.743)
City FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	1,574	1,357	1,574	1,357
R^2	0.618	0.666	0.518	0.592

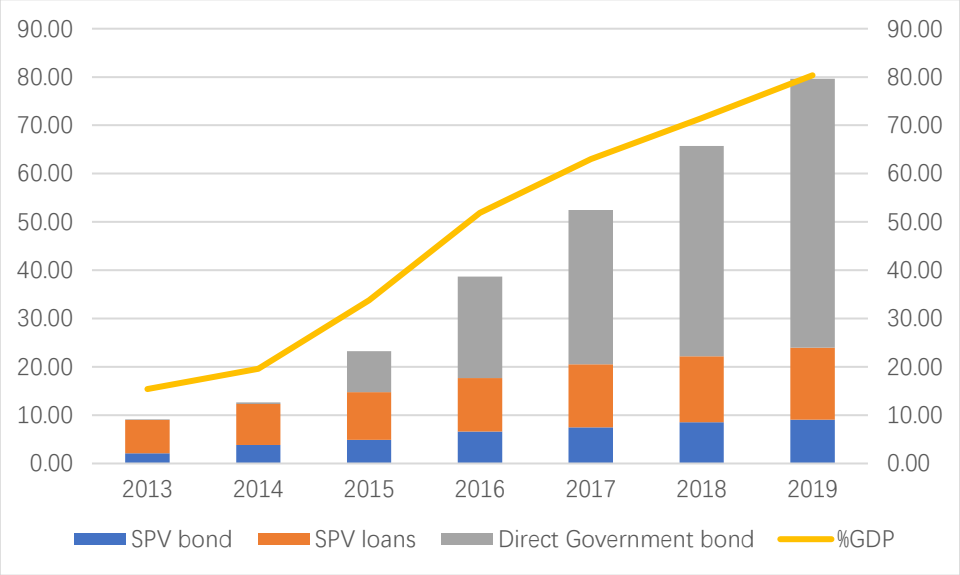
Table A.6 Hidden local government debt

This table reports regression coefficients related to different types of local government debt. The dependent variables for columns (1)-(3) are account receivables, the dummy variable indicating whether the firm has multiple contracts with the government, and the dummy variable indicating whether there is any protest. We measure hidden debt with 1[High Pressure from LGFV], which is defined as 1 if the percentage of LGFV debt to fiscal income is higher than the median of total debt level, and 0 otherwise. 1[High Pressure from Gov't Direct] is defined as 1 if 1) total debt level is higher than the median and 2) 1[High Pressure from LGFV] is zero. All regressions include year and city fixed effects. Standard errors are clustered by city and are reported below the regression coefficients. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent variable:	Account receivables (% of Assets)	1[Multiple contracts] (%)	1[Protest] (%)
	(1)	(2)	(3)
1[Gov. supplier]×1[High Pressure from LGFV]	2.372***	-7.757***	0.191***
	(0.313)	(0.941)	(0.071)
1[Gov. supplier] ×1[High Pressure from Gov't Direct]	0.564	-7.259	-0.146*
	(1.287)	(4.858)	(0.076)
Control	Yes	Yes	Yes
Firm FE	Yes		
Year FE	Yes	Yes	Yes
Industry x year FE	Yes	Yes	Yes
City FE	Yes	Yes	Yes
Observations	46,549	46,549	46,549
R^2	0.871	0.072	0.018

Figure A.1. Outstanding and maturing debt components and as percentage of total GDP.

Panel A: Outstanding debt components and as percentage of GDP



Panel B. Maturing debt and as percentage of fiscal income.

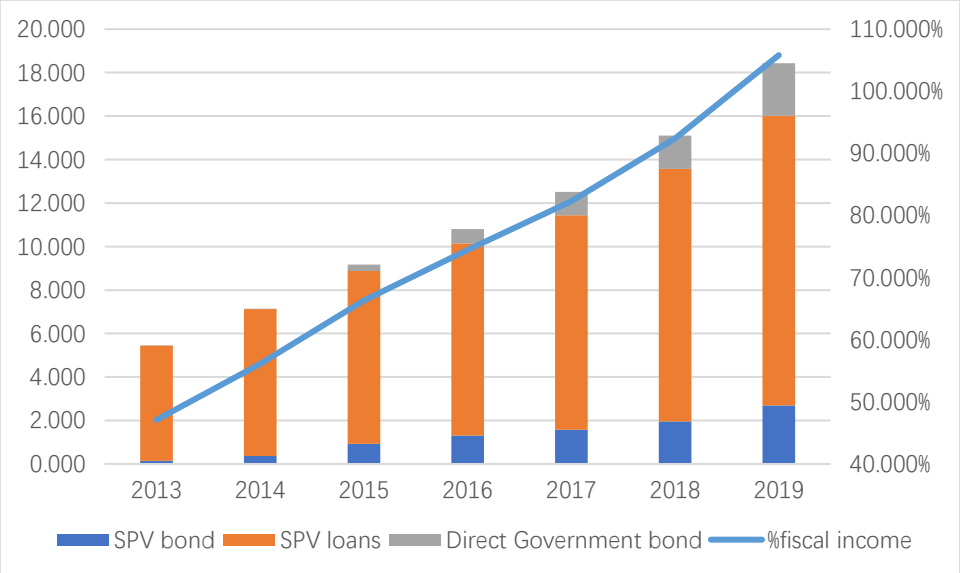
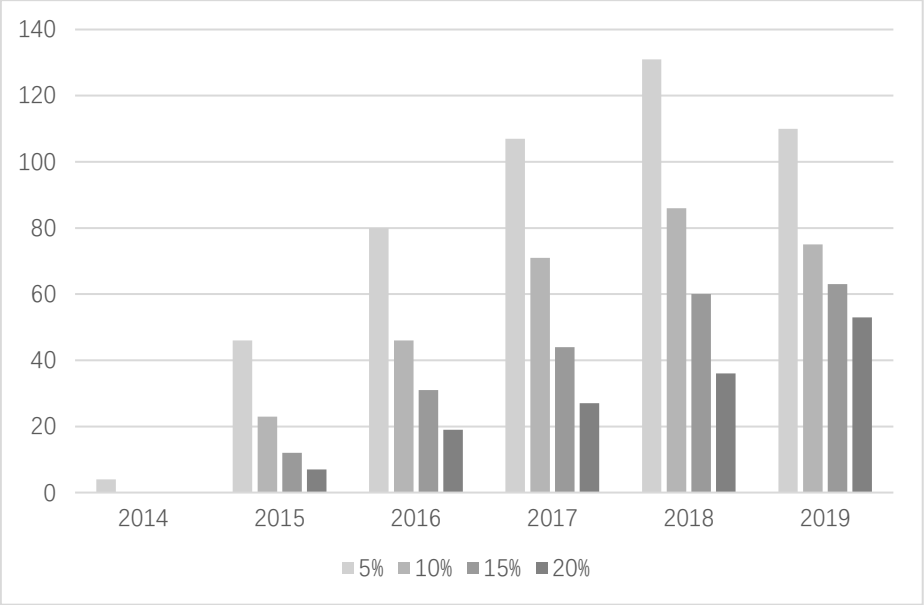


Figure A.2 Local government debt accumulation over 2014-2019.

Panel A. Number of cities with percentage of maturing debt to fiscal income higher than certain thresholds. (Total: 295 cities)



Panel B. Number of cities with percentage of outstanding debt to fiscal income higher than certain thresholds. (Total: 295 cities)

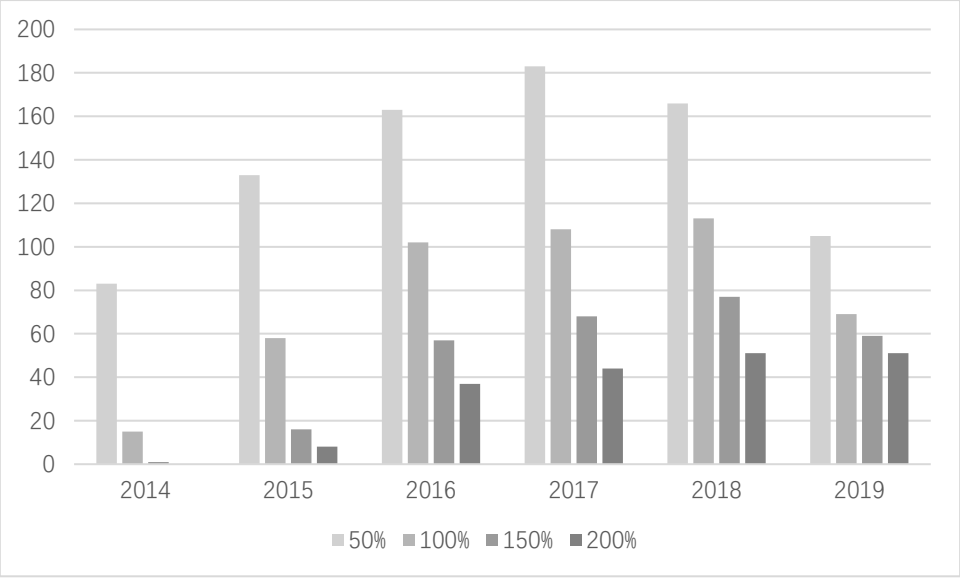


Figure A.3 One procurement contract published by local governments

公告信息：			
采购项目名称	国家税务总局曲阜市税务局综合业务办公用房维修改造项目		
品目	工程/修缮工程/房屋修缮, 工程/装修工程		
采购单位	国家税务总局曲阜市税务局		
行政区域	曲阜市	公告时间	2019年07月29日 10:23
本项目招标公告日期	2019年07月03日	中标日期	2019年07月26日
评审专家名单	杜峻、骆雅琳、桑志华、韩宝进、刘元涛		
总中标金额	￥288.398838 万元（人民币）		
联系人及联系方式：			
项目联系人	许永刚		
项目联系电话	13355188817		
采购单位	国家税务总局曲阜市税务局		
采购单位地址	山东省曲阜市春秋路4号		
采购单位联系方式	孔科长 0537-4692188		
代理机构名称	山东省鲁成招标有限公司		
代理机构地址	山东省济宁市任城区古槐路58-9号201室		
代理机构联系方式	许永刚 13355188817		

Figure A.4 Number of cases between government and firm

This figure listed the total number of cases related to a procurement contract between the government entity and firm, and the number and percentage of cases rejected by the court.