

Tiered Intermediation in Business Groups and Targeted SME Support

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Motivation

Financing SMEs has been challenging, especially during the current crisis (COVID-19).

- ▶ Small and medium-sized enterprises (SMEs) were hit much harder than their large counterparts (CEPR, 2020).
- ▶ SMEs benefit little from the monetary easing or direct bank lending: smaller, younger, shorter creditworthiness record (Gilchrist et al., 1998); lack of collateral (Carpenter and Peterson, 2002); lack of long-term bank relationship (Peterson and Rajan, 1994); sensitive to bank liquidity shocks or credit cycle (Khawaja and Mian, 2008; Greenstone et al., 2020).
- ▶ Things worsen off - tightened regulatory requirement after global financial crisis (BIS, 2018); Banks' risk appetite shift to larger corporates (Bassett et al., 2014).

Financing SMEs has been challenging, especially during the current crisis (COVID-19).

- ▶ Other support programs like government credit guarantees, debt payment deferrals, directed lending through special purpose vehicles (World Bank 2020), still some problems
 1. Expose the governments to credit risks
 2. Difficult to achieve efficiency (D'Ignazio and Menon,2013; Bhue et al.,2016;Chatzouz et al.,2017; SBA,2020)

The key questions,

1. How to provide targeted and effective support to SMEs?
2. Through what intermediaries?

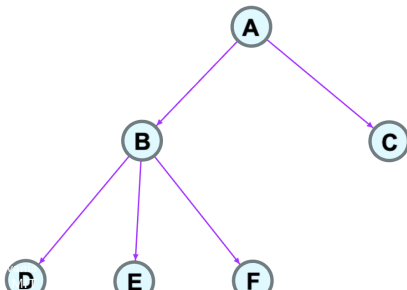
Using administrative data, this paper shows that in China

1. Smaller firms in business groups, without direct bank credit access but with high returns, can be reached through **internal capital markets**
2. Parent firms as intermediaries - transfer the banking sector credit supply shocks to their subsidiaries
3. Explore the interactions between **bank-lending channel** and **internal capital markets**, the first paper to look into the policy angle.

Motivation

Business Groups

- ▶ Business Groups - a group of legally independent firms under the umbrella of common ownership
 1. firms are connected through **equity-holdings**.
 2. Parent-subsidary relationship: $A \rightarrow B, C$; $B \rightarrow D, E, F$
 3. So far, we only look at the direct equity linkage



Main Results

1. Business groups populate the whole economy: in our data sample, 80% of registration capital, 70% of fixed capital.
2. Propagating bank credit to subsidiaries through parent companies in business groups
 - 2.1 When shareholders' cities experience an average of 16.7% (the average city-level credit growth in our sample) of local bank credit growth, subsidiary investment increase by 1% of fixed asset, ...
 - 2.2 The effect is economic large, accounts for 71% (7%) of the median (average) investment rate
 - 2.3 Comparable in magnitude to the direct bank-lending effect (Cingano et al., 2016)

Main Results

3. Tiered intermediation

3.1 Works: banks → parents → subsidiaries

3.2 Not work: banks → subsidiaries → subsidiaries; banks → subsidiaries
→ parents

4. Mechanism

4.1 Associated with subsidiaries' positive response in investment, **equity** is transferred from subsidiaries to parents.

4.2 ..., no significant change in external financing condition for subsidiaries.

More Results

5. Challenges

5.1 Endogeneity: correlated credit demand across cities

5.2 Interpretation: overlapping with other economic linkages

5.2.1 Upstream-downstream linkages

5.2.2 Trade Credit linkages

5.2.3 Geographical linkages

5.2.4 Tunneling effects

6. This shareholder-subsidary linkage becomes more significant when:

6.1 Subsidiary firms face **tighter financial constraint**

6.2 Subsidiary firms have **better investment opportunity**

6.3 Shareholders are **controlling**, but **do not apply** to SOEs

6.4 Results **do not apply** to SOEs or Foreign Subsidiaries

1. **Bank lending channel:** (Bernake,1983; Ashcraft,2005; Khawaja and Mian,2008, Cingano, 2016; Greenston et al., 2020)
 - We document a bank-lending channel but beyond the direct bank-firm relationship.
2. **Internal capital markets (ICM):**
 - 2.1 resource reallocation within business groups (Scharefstein et al., 1991; Shin and Stulz,1998; Giroud and Mueller,2015; Almeida et al., 2015; Santioni et al., 2017)
 - 2.2 Tunneling effects (Porta and Shleifer 1999; Claessens,2000; Jiang,2010, Gul, 2010)
 - We examine the interaction between ICM and external financial markets, shed light on the macroeconomic implications of liquidity provision to SMEs.

3. Financing SME:

- 3.1 Poor access to bank financing: asymmetric information, lack of collateral (Carpenter and Peterson, 2002); lengthy period of relationship building (Peterson and Rajan, 1994); sensitive to bank liquidity shocks and credit cycles (Khwaja and Mian, 2008; Greenston et al., 2020)
- 3.2 rely more on non-bank financing: intercompany lending (Canales and Nanda, 2012), trade credit (Carbo-Valverde et al., 2016), social networks (Banerjee, 2013), or industrial clusters (Long and Zhang, 2011).
 - We show large non-financial corporates pass bank credit to smaller subsidiaries, overcoming various shortcomings of the traditional direct bank-lending to SMEs.

4. Shadow banking activities in China: (Allen et al., 2019; Chen et al., 2018; Chen et al., 2020)

1. Business groups

- ▶ Business registry data from the State Administration for Industry and Commerce (SAIC)
- ▶ Covers the entire universe of firms in China (40 million in 2017)
- ▶ Include detailed information on shareholders for each company, and its historical update
- ▶ %16 in business groups, but contribute to more than 80% of registration capital,

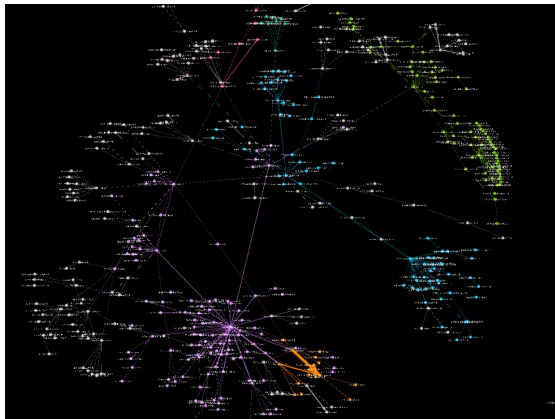
2. Manufacturing firm balance sheet from Annual Survey of Chinese Industry Enterprises (ASCIE)

- ▶ more than 90% can be matched to SAIC
- ▶ firms in business groups contribute to 70% of fixed capital ...

3. City(prefecture) level

- ▶ Credit growth from city yearbooks
- ▶ Bank branch information from Chinese Banking Regulatory Committee (CBRC)

- ▶ Haier Group: nested and pyramid structure (Allen et al., 2019)



- ▶ Baseline Specification and results
- ▶ Challenges
 1. endogeneity - Bartik-type IV
 2. Interpretation - overlaps with other business relationship

- ▶ Subsidiaries respond to parent company credit supply shocks:

$$Y_{it} = \alpha_{ct} + \eta_{ind,t} + \theta_i + \gamma CreditGrowth_{i,pt} + \kappa' X_{it} + \epsilon_{it}$$

1. Y_{it} : investment, R&D, profit margin, leverage growth, debt growth
2. $CreditGrowth_{i,pt}$: the average bank credit growth where **non-local** shareholders experience (**fix business group at 2001**):

$$CreditGrowth_{i,pt} = \log\left(\sum_{j \in H_{i0,c(j)} \neq c} Loan_{c(j),t}\right) - \log\left(\sum_{j \in H_{i0,c(j)} \neq c} Loan_{c(j),t-1}\right)$$

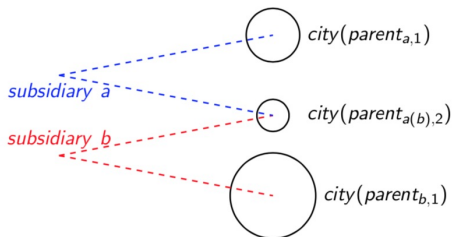
3. Controls: Firm fixed effect θ_i , city-cross-year α_{ct} , industry-cross-year fixed effect $\eta_{ind,t}$, and other firm-level characteristics X_{it} .

Key Identification

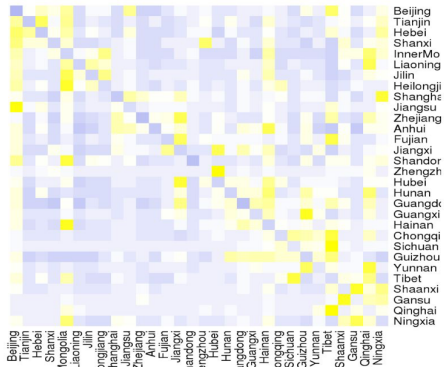
Large geographical diversification of the business groups

37% of parent-subsidary pairs where parent and subsidiary are located in different cities.

Consider: two similar subsidiaries a and b in the same city, but with parents located in different cities, exposed to different city-level credit growth



Geographical diversification of parent-subsidiary pairs



The Baseline Results

Table: The Baseline Results

	(1)	(2)	(3)
	Investment	R&D	Profit Margin
<i>CreditGrowth_{ipt}</i>	0.0619*** (0.014)	0.0144 (0.012)	-0.0061 (0.003)
# of Obs.	1,379,261	1,015,249	1,535,540
City × Year FE	Yes	Yes	Yes
2-digit CIC × Year FE	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Firm-level controls	Yes	Yes	Yes

Challenges

Challenge 1: Endogeneity

- ▶ Our baseline identification valid as long as parent's city credit growth uncorrelated with subsidiary's city credit demand
- ▶ Well geographically diversified business groups, and city-cross-year fixed effects also help us mitigate the concern
- ▶ Remaining challenge: credit demand across cities might be correlated
- ▶ To further mitigate the concern: find an IV that is correlated with parent's city credit supply shocks, but uncorrelated with subsidiary's city demand

Challenge 1: Endogeneity

Solution: Bartik-IV (Greenstone et al., 2020) using the bank branch information:

- ▶ For each bank, projected growth of # of country-wide bank branches proxies for credit growth
- ▶ Banks expanded fast in branches were more ambitiously giving new credits to firms
- ▶ Cities with a large presence of such ambitious banks, would experience large credit supply shocks
- ▶ \sum_b (country-wide bank b branch growth \times the initial market share of b at city c) - not driven by local city credit demand

Challenge 1: Endogeneity

Table: The Instrumental Variables Approach

	(1)	(2)	(3)
	First Stage	Second Stage	
	$CreditGrowth_{pt}$	Investment	Leverage
Branch Bartik IV	1.643***		
Z_{pt}	(0.019)		
F-Value	1.2×10^4		
$CreditGrowth_{pt}$		0.258**	-0.017
		(0.102)	(0.015)
# of Obs.	249,785	249,785	285,555
City \times Year FE	Yes	Yes	Yes
2-digit CIC \times FE	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Firm-level Controls	Yes	Yes	Yes

Challenge 2: Interpretation

Other possible explanations?

- ▶ Overlays with other business networks
 - ▶ Supply chain (Clayton and Jorgenson,1999): proxies for upstream supply shocks and downstream demand shocks based on the input-output table (Acemoglu et al., 2016)
 - ▶ Trade credit: account payables and receivables
 - ▶ Geographical overlays of industries (Acemoglu et al., 2016): ind. \times ind. FE; city \times city FE
- ▶ Tunnelling effect
 - ▶ common shareholder dummy - common shareholder move the resources from one subsidiary with low cash-flow rights to the another with high cash-flow rights (Porta and Shleifer, 1999 et al.,)

Overlays with other business relationships

Table: Overlays with other networks

	(1)	(2)	(3)	(4)	(5)
	Investment				
<i>CreditGrowth_{ipt}</i>	0.0571** (0.0143)	0.0624*** (0.0143)	0.0413** (0.0157)	0.0480*** (0.0144)	0.0625*** (0.0144)
Log(Demand from downstream)	0.00213 (0.00212)				
Log(Supply from upstream)	0.00213 (0.00211)				
Account Payable		-0.0992*** (0.00679)			
Account Receivable		-0.986*** (0.0135)			
Shareholder Ind. × Subsidiary Ind.FE	NO	NO	YES	NO	NO
Shareholder city × Subsidiary city FE	NO	NO	NO	YES	NO
Common Shareholder Dummy	NO	NO	NO	NO	YES
City × Year FE	YES	YES	YES	YES	YES
2-digit CIC × Year FE	YES	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES	YES
Firm-level Controls	YES	YES	YES	YES	YES

- ▶ Tiered Intermediation
 - ▶ Works: parents → subsidiaries
 - ▶ Not work: subsidiaries → subsidiaries, subsidiaries → parents
- ▶ Mechanism: **equity transfers** from subsidiaries to shareholders in exchange for cash.

Table: Tiered Intermediation

	Subsidiary Firms' Investment	Shareholders' Investment
Credit Growth of Other Subsidiaries Under Common Ownership	0.00733 (0.0237)	
Credit Growth in Subsidiaries' Cities		-0.0157 (0.0236)
City \times Year FE	Yes	Yes
2-digit Industry \times Year FE	Yes	Yes
Firm FE	Yes	Yes
Firm-level Controls	Yes	Yes

The equity transfer channel

Table: Equity Transfer in Response to Credit Supply Shocks

	OLS	IV
	Equity Share held by Corporate Shareholders (%)	
$CreditGrowth_{i,pt}$	3.38*** (0.084)	10.070*** (0.127)
Number of Observations	748,829	379,261
City \times Year FE	Yes	Yes
2-digit Industry \times Year FE	Yes	Yes
Firm FE	Yes	Yes
Firm-level Controls	Yes	Yes

The equity transfer channel

Table: Equity Transfer in Response to Credit Supply Shocks

	OLS	IV
	Equity Share held by Corporate Shareholders (%)	
$CreditGrowth_{i,pt}$	3.38*** (0.084)	10.070*** (0.127)

- ▶ 0.5% additional equity shares are sold by the subsidiaries to their shareholders following an average 16.7% credit growth in shareholders' cities, which is worth of 2.5 millions RMB on average.

Heterogenous effects

- ▶ More significant when ...
 - ▶ subsidiaries face **tighter financial constraint**
 - ▶ external finance dependence (***)
 - ▶ subsidiaries have **better investment opportunity**
 - ▶ lagged ROA (***), ROC(***), TFP(***), sale growth(***)
 - ▶ the shareholders are **controlling...**

- ▶ Results **do not apply** to SOEs
 - ▶ SOE shareholders do not pass credit to subsidiaries
 - ▶ SOE subsidiaries do not respond to shareholders' credit supply

Subsidiary firm financial vulnerabilities

Table: Financial Vulnerabilities and the Pass-through of Credit Shocks

	(1)	(2)	(3)	(4)
	Investment			
<i>CreditGrowth_{ipt}</i>	0.0463 (0.0371)	0.110*** (0.0316)	0.0994*** (0.0351)	0.107*** (0.0310)
<i>CreditGrowth_{ipt}</i> × High ext. fin. dep.	0.116*** (0.0493)			
High inventory ratio		-0.0149 (0.0542)		
High Tangible Asset Ratio			0.0141 (0.0523)	
High Trade Credit Ratio				-0.00737 (0.0567)

Subsidiary firm investment opportunities

Table: Investment Opportunities and the Pass-through of Credit Supply Shocks

	(1)	(2)	(3)	(4)
Investment (High external financial dependence firms)				
$CreditGrowth_{ipt}$	0.111** (0.0466)	0.110*** (0.0428)	0.123** (0.0480)	0.0777* (0.0451)
$CreditGrowth_{ipt} \times$ High ROA(t-1)	0.097*** (0.00470)			
High ROC(t-1)		0.089*** (0.00506)		
High TFP(t-1)			0.071*** (0.00466)	
High Sales Growth(t-1)				0.064*** (0.00467)

SOE shareholders not affecting subsidiary investment

Table: SOE versus Non-SOE Shareholders

	(1)	(2)	(3)	(4)
	Baseline	Size-adjusted	Share-adjusted	Simple-average
<i>CreditGrowth_{ipt}</i> (SOE holders)	-0.0638 (0.0532)	-0.0119 (0.0741)	-0.0870 (0.0768)	-0.0602 (0.0650)
<i>CreditGrowth_{ipt}</i> (non-SOE holders)	0.0664*** (0.0191)	0.108*** (0.0238)	0.0918*** (0.0255)	0.0739*** (0.020)
Number of Observations	1,314,458	1,314,458	1,314,458	1,314,458
City × Year FE	Yes	Yes	Yes	Yes
2-digit CIC × Year FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Firm-level Controls	Yes	Yes	Yes	Yes

SOE subsidiaries not responding

Table: Heterogeneous Response of Subsidiaries

	(1)	(2)	(3)
	Domestic Private	SOEs	Foreign-invested
$CreditGrowth_{i,pt}$	0.0946*** (0.0217)	0.00945 (0.0329)	0.00724 (0.0229)
Number of Observations	970,214	115,653	209,310
City \times Year FE	Yes	Yes	Yes
2-digit Industry \times Year FE	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Firm-level Controls	Yes	Yes	Yes

Conclusion

- ▶ Document a large ownership network, contribute to more than 70% of Chinese Economy.
- ▶ Document a tiered intermediation, banking credit can reach smaller firms without direct bank access through their corporate shareholders.
- ▶ Furthermore, equity transfers between shareholders and subsidiaries is one channel.
- ▶ This tiered intermediation works efficiently, financially constrained firms with good investment opportunities benefit much more.
- ▶ Important implications on the bank lending channel, targeted SME support, and Macro. Specifically, measures to support SMEs can focus on stand-alone firms

Thank You Very Much