Credit and Fiscal Multipliers in China

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Discussed by

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Research Question

- How did credit growth contribute to output growth in China?
- Can fiscal stimulus support output growth?
- The long-standing debate on the effects of public spending on economic outcomes
  - American Recovery and Reinvestment Act of 2009
  - China's stimulus plan 2008-09
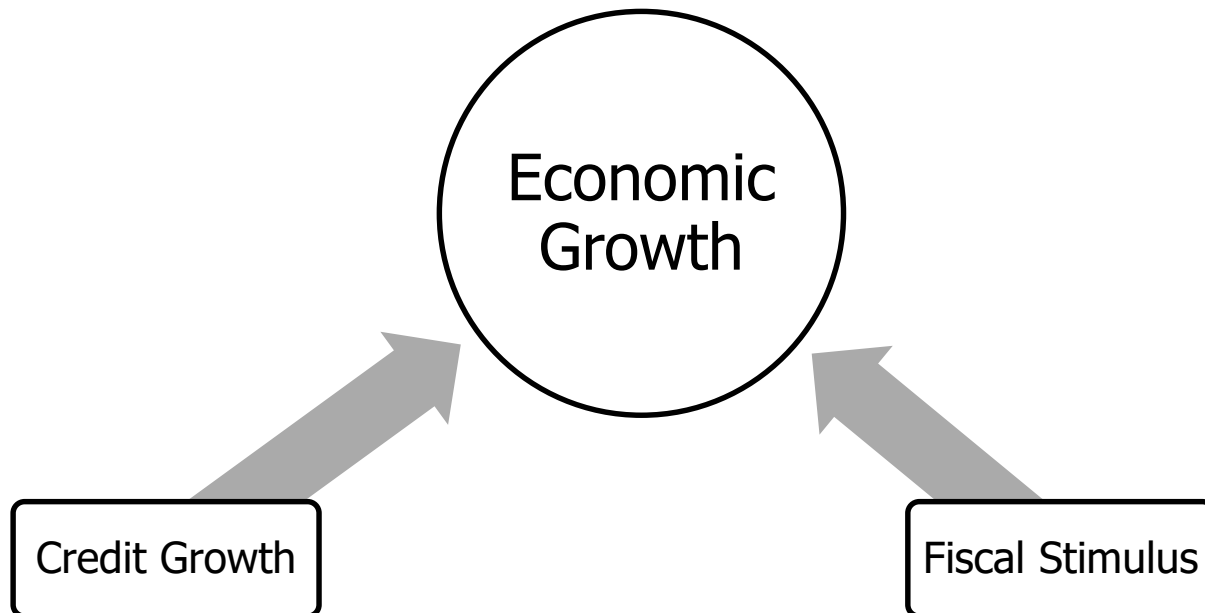
Summary of the Findings

- Cross-province sample in China
- Building on a novel identification strategy:

Output Growth		2001-2008	2010-2015
	Fiscal Multiplier	0.75	1.4
	Credit Multiplier	0.17	0
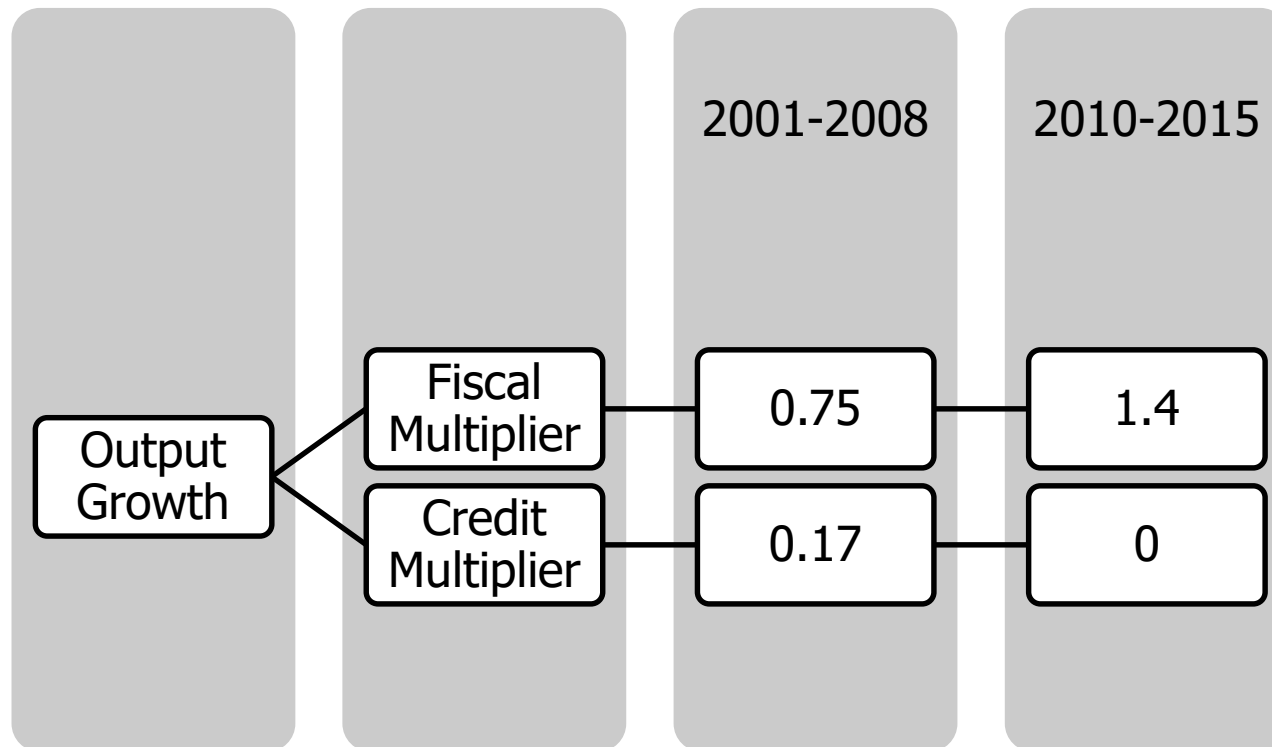
Summary of the Findings

- <u>Empirical challenges</u>: government expenditure and credit are decision variables.

  - Omitted variable bias: confounding factors
  - Reverse causality: anticipation effect

- <u>Identification</u>: the tenure of provincial party secretaries as a source of exogenous variation in credit and fiscal expenditure

  - the timings of appointments (or reappointments) of provincial party secretaries are exogenous to provincial economic conditions.

  - party secretaries have incentives to use macroeconomic stimulus at strategically important times during their tenure to improve the prospect of their retention or promotion. Tournament hypothesis.

General Comments

- Very Good Paper!
- Contribution to the literature using unique institutional details in China
- Solid empirical analyses and rich empirical findings
  - great efforts in ruling out alternative explanations
- Profound policy implications
- Well written

- *My comments are more likely to be suggestions.*

Comment 1: Position in the Literature

Traditional empirical macroeconomics literature employs time-series analysis: see Ramey (2011) for a survey

Cross-sectional analysis on fiscal and credit policies

Fiscal Policy + Credit Policy

"Finance and Growth" Literature: Cross-country evidence: e.g. Levine and Renelt (1992, AER), King and Levine (1993, QJE)

Identification Strategy

Fiscal Policy

- Cross-country analysis — Kraay (2012) QJE — World Bank lending

- Region-level analysis
  - US: Nakamura and Steinsson (2014, AER) — Military procurement spending — IV: regional variation in military buildups
  - Italy: Acconcia et al. (2014, AER) — Local public spending — Natural experiment
  - US: Leeper et al. (2017, AER)
  - Japan: Bruckner and Tuladhar (2014, EJ), prefecture-level — transfers to firms vs. transfers to households

- Firm-level responses
  - Cohen, Coval, and Malloy (2011, JPE) — Investment and employment — changes in congressional committee chairmanship
  - Belo et al. (2013, JFE) — Cross-section of stock returns

Credit Policy

- Region-level analysis
  - Jayaratne and Strahan (1996) — Financial market and growth — Banking deregulation
  - US: Adelino et al. (2017, RFS), county-level — Public financing — Natural experiment based on Municipal Bond Ratings Recalibration

- Firm-level analysis
  - A large group of studies on different firm responses using banking deregulation — Banking deregulation
  - Song et al. (2011, AER) — credit, SOE and private firms
  - Ru (2018, JF) — Government Credit and crowding out effect — City leader turnover
  - Gao, Ru and Tang (2017) — subnational debts
  - Gao, Ru, Townsend, Yang (2017) — bank competition — Banking deregulation in China
  - Huang et al. (2017) — government debts and investment
  - Cong et al (2017) — stimulus plan, credit allocation

This paper: Chen, Ratnovski and Tsai

Comment 2: Identification

- Unique institutional setting in China
  - Political personnel system: Political promotion tournament
  - Rotation: 干部交流 (Ganbu Jiaoliu): Officials are regularly rotated among bureaucratically equivalent position.
  - (1) The timings of appointments (or reappointments) of provincial party secretaries are exogenous to provincial economic conditions.
  - (2) Incentives to use macroeconomic stimulus at strategically important times during their tenure to improve the prospect of their retention or promotion.
  - First stage:

$$Credit_{i,t} = \beta_0 + \beta_1 \, Credit_{i,t}^{Others} + \beta_2 \, Tenure_{i,t}$$
$$+ \beta_3 \, Credit_{i,t}^{Others} \cdot Tenure_{i,t} + Year_t + Province_i + u_{i,t}$$

Comment 2: Identification

- Ru (2018, JF)
- City Secretary Turnover and Borrowing from the CDB
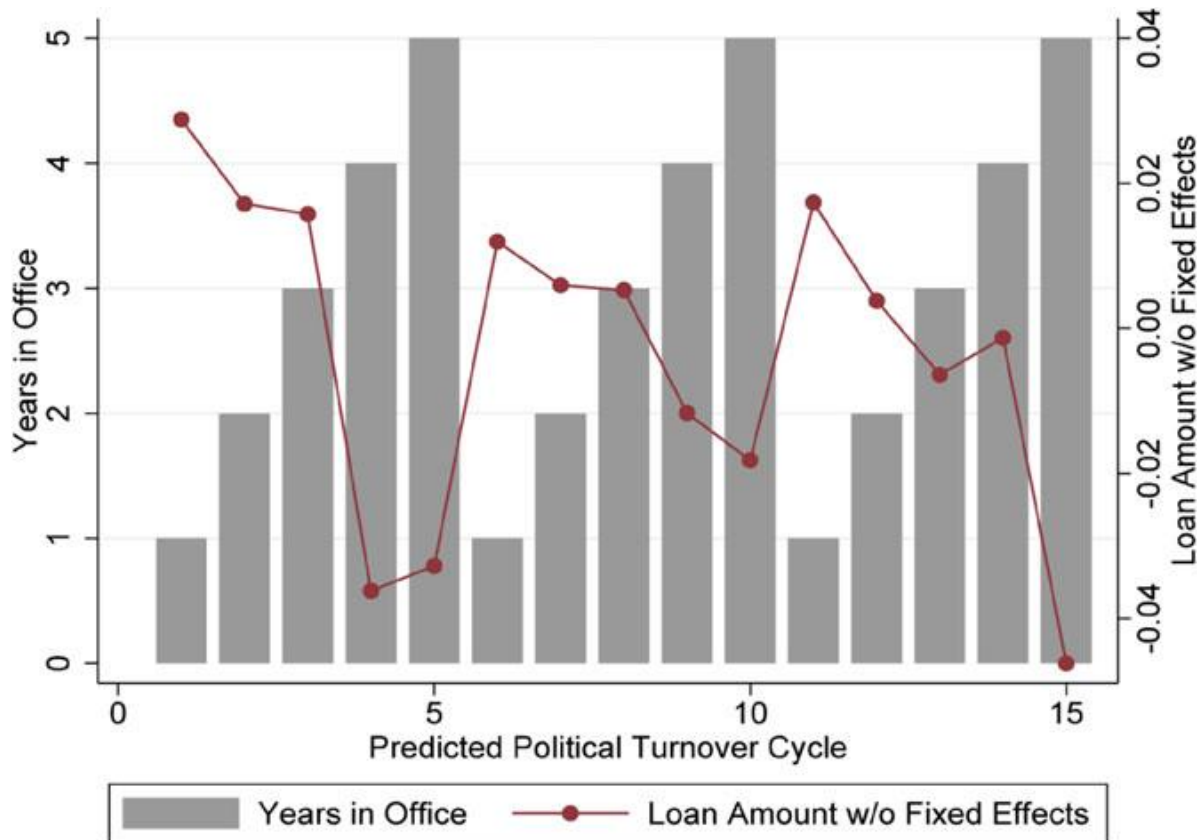
Comment 2: Identification

- Ru (2018, JF)
- City Secretary Turnover and Borrowing from the CDB
- First stage regression:

$$Log\,Loan_{j,t} = \alpha + \beta_1 \times Year\_1_{i,j,t} + \beta_2 \times Year\_2_{i,j,t} + \beta_3 \times Year\_3_{i,j,t}$$
$$+ \beta_4 \times Year\_4_{i,j,t} + \beta_5 \times Year\_5_{i,j,t} + \beta_6 \times Year\_6_{i,j,t}$$
$$+ X \times Control_{j,t-1} + Fixed\,Effects + \varepsilon_{j,t}.$$

Dependent Variable	(1) Log(Loan_PI)	(2) Log(Loan_PI)	(3) Log(Loan_PI)
First	0.341***		
	(0.118)		
Second	0.285**		
	(0.105)		
Third	0.274***		
	(0.090)		
Fourth	0.260**		
	(0.115)		
Fifth	0.211**		
	(0.100)		
Sixth	0.044		
	(0.131)		
FirstSecond		0.413***	
		(0.134)	
FirstThird			0.386***
			(0.119)
$Control_{t-1}$	Yes	Yes	Yes
Fixed effects	Yes	Yes	Yes
Observations	4,445	4,445	4,445
R^2	0.564	0.561	0.561

Comment 2: Identification

- Gao (2009, AJPS): China's Local Political Budget Cycles
- County leader tenure and Expenditure Growth: non-linear function

| Dependent Variable: Annual Growth Rate of Expenditures Per Capita Explanatory Variables	Party Secretary Model Coefficient (Standard Error)		Chief Executive Model Coefficient (Standard Error)	
(Time in office)^2	−0.3946**	−0.4860**	−0.3463**	−0.3893*
	(0.1728)	(0.2049)	(0.1688)	(0.2011)
Time in office	2.4793**	3.1624**	2.4976**	2.8675**
	(1.0212)	(1.2252)	(0.9752)	(1.1739)
Annual growth rate of revenues per capita	0.2493***	0.2589***	0.2615***	0.2743***
	(0.0142)	(0.0166)	(0.0139)	(0.0164)
Annual growth rate of subsidies per capita		0.1411***		0.1303***
		(0.0092)		(0.0089)
Year 1998	−5.1573***		−4.6804***	
	(1.0930)		(0.9915)	
Year 1999	−1.5038	0.0329	−1.2599	0.1672
	(1.0520)	(1.1108)	(0.9658)	(1.0263)
Year 2000	base	base	base	base
Year 2001	13.3966***	11.1666***	13.1974***	11.0564***
	(1.0246)	(1.0836)	(0.9537)	(1.0175)
Year 2002	8.1638***	7.7660***	8.7605***	8.1523***
	(1.0224)	(1.0713)	(0.9576)	(1.0142)
(constant)	8.6638***	3.1056*	7.8702***	3.1947*
	(1.4945)	(1.7521)	(1.4044)	(1.6621)
N Observations	7,070	5,774	7,562	6,103
Groups	1,696	1,667	1,741	1,718
R-squared Within	0.1179	0.1569	0.1242	0.1558
Between	0.1228	0.2049	0.1147	0.1905
Overall	0.1166	0.1602	0.1215	0.1585

Comment 2: Identification

- How to reconcile the findings with other studies with granular level analysis?

- More institutional details.

- Show first-stage results as the identification is one innovative part of the paper.

- How is results using the reduced form?

- Other potential suggestions:
  - Retirement effect
  - Possible for city or county level analysis?
  - The second period is overlapped with the anticorruption campaign. Use politician crackdowns as exogenous shocks?

Comment 3: GDP Statistics

- Anecdotal evidence suggests "cooking the book" by Chinese politicians is prevalent.

    – In 2017, top leaders of Liaoning province officially admitted in Liaoning Provincial People's Congress: "The municipal and county governments under the jurisdiction of Liaoning Province generally have data fraud behaviors, and they are characterized by long duration, wide coverage and diverse means."

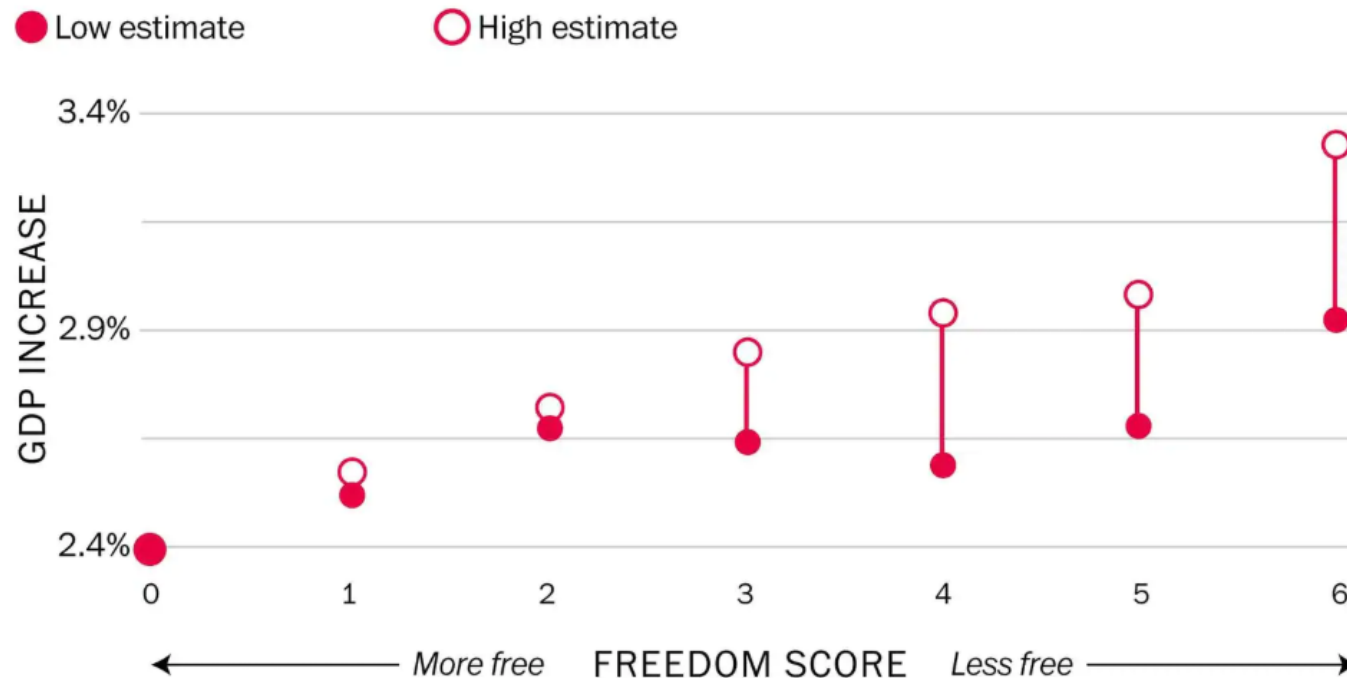   – In 2018, top leaders of Inner Mongolia and Tianjin admitted their governments also had data fraud behavior.

Comment 3: GDP Statistics

- Reported GDP growth vs. GDP target (Lyu, 2018, JAE)

The -0.1 Bin: Unexpected Percent = -2.24 % (t = -5.46)

The 0 Bin: Unexpected Percent = 2.39% (t=7.49)
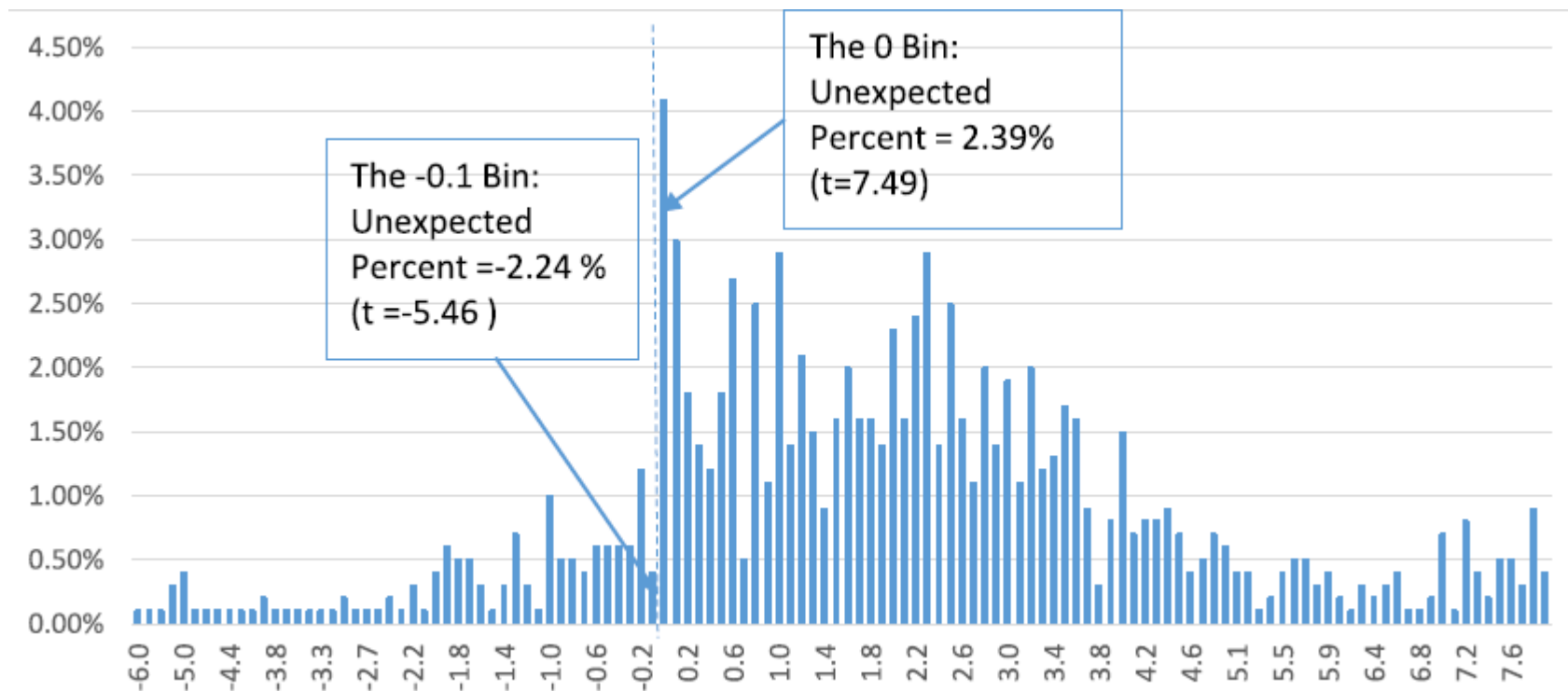
Comment 3: GDP Statistics

- How Much Should We Trust the Dictator's GDP Estimates? (Martinez et al, 2018)

- Suggestions: Use Night Lights to adjust for GDP manipulations

Comment 4: Model Specification

- Baseline model

$$\frac{Y_{it} - Y_{it-2}}{Y_{it-2}} = \alpha_i + \gamma_t + \beta_G \frac{G_{it} - G_{it-2}}{Y_{it-2}} + \beta_{CR} \frac{CR_{it} - CR_{it-2}}{Y_{it-2}} + \varepsilon_{it}$$

- Both right-hand side and left-hand sides are constructed using the same time periods. It takes some times in for the fiscal and credit policy work.

- Suggestion: An alternative approach would be to use one-year changes in output and government spending and include lags and leads of the independent variable of interest on the right-hand side.

Comment 4: Model Specification

- Dynamic effects in Acconcia et al. (2014, AER)

	OLS		2SLS		2SLS	
			First stage	Second stage	First stage	Second stage
$G(t)$	0.21** [0.07]	0.23** [0.07]		1.46** [0.49]		1.55*** [0.43]
$G(t-1)$	0.22** [0.08]	0.26** [0.08]	−0.41*** [0.07]	0.73*** [0.21]	−0.41*** [0.07]	0.79*** [0.19]
$G(t-2)$	0.00 [0.07]	0.04 [0.07]	−0.13* [0.06]	0.14 [0.11]	−0.13* [0.06]	0.19 [0.11]
$Y(t-1)$		−0.16* [0.06]			0.03 [0.02]	−0.20** [0.06]
$Y(t-2)$		−0.03 [0.05]			−0.02 [0.02]	−0.02 [0.05]
$CDS1(t)$			−2.07*** [0.54]		−1.97*** [0.56]	
$CDS2(t-1)$			−4.02*** [0.98]		−4.08*** [0.94]	
F-stat instruments			12.58		11.83	
Observations	950	950	950	950	950	950

Comment 4: Model Specification

- The evolution of the multipliers

Table 4. Early and late subsamples results

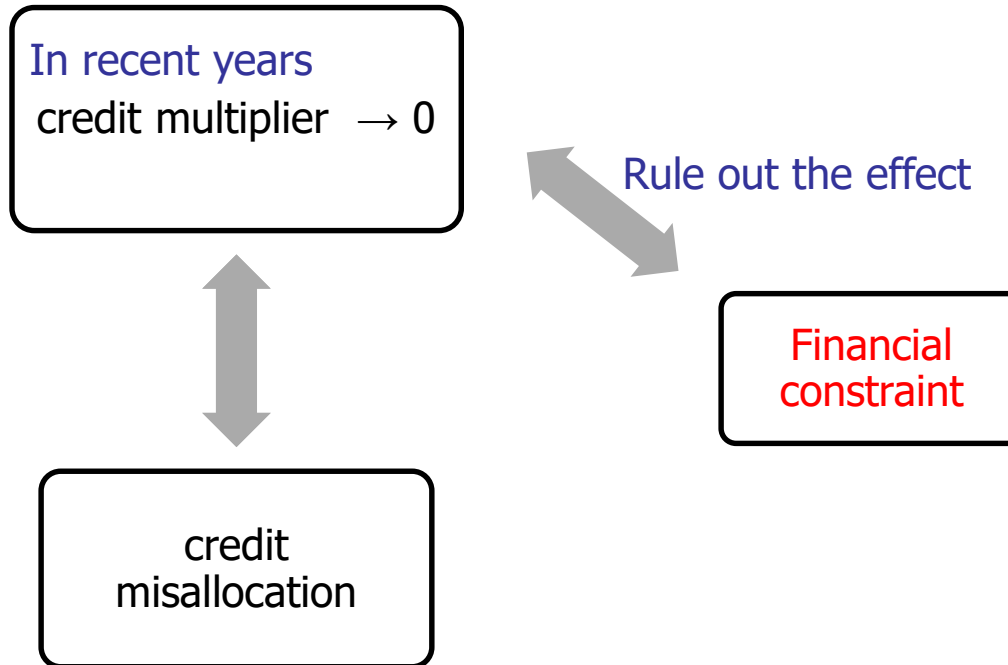| | Real GDP | | | |
| | 2001-2008 | | 2010-2015 | |
| | 1 | 2 | 3 | 4 |
	OLS	IV	OLS	IV
Real Credit	0.219***	0.215**	0.197*	0.107
	[0.063]	[0.089]	[0.109]	[0.083]
Real Expenditure	0.656***	0.747**	0.766***	1.184***
	[0.176]	[0.311]	[0.253]	[0.256]
Observations	166	165	108	108
R-squared	0.681		0.902	
Year and province FE	Yes	Yes	Yes	Yes
Cragg-Donald Wald F		18.07		14.04
Kleibergen-Paap rk Wald F		11.96		7.626

Decreased by 50%

Increased by 58%

Are the differences statistically significant?

Comment 5: Type of government spending

- This paper considers on-budget expenditure vs. off-budget expenditure.
- It will help if we can differentiate the effect of government spending according to the spending types.
- Bruckner and Tuladhar (2013, EJ):
  - The Local Government Expenditures Output Multiplier (Local Government Expenditures by Type)

	GDP				
	(1)	(2)	(3)	(4)	(5)
Transfers to firms	5.62***				4.01**
	(1.54)				(1.82)
Social assistance		−3.88**			−3.87***
		(1.63)			(1.43)
Ordinary construction			1.38***		1.06**
			(0.51)		(0.43)
Government personnel				−1.28	−0.23
				(2.41)	(2.13)
Lagged GDP	0.76***	0.83***	0.70***	0.87***	0.59***
	(0.05)	(0.04)	(0.06)	(0.04)	(0.06)
AR(1) test, p-value	0.00	0.00	0.00	0.00	0.00
AR(2) test, p-value	0.08	0.33	0.12	0.20	0.14
Prefecture FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Observations	470	470	470	470	470

Comment 6: Interpretations

In recent years
credit multiplier → 0

Rule out the effect

Financial constraint

credit misallocation

Comment 6: Interpretations

When High SOE profit
=0, fiscal multiplier =0

How these provinces
geographically
distributed?

Does it imply that the
effect of fiscal policy is
through supporting
productive SOEs?

Table 5. Provincial heterogeneity

	Real GDP					
	1	2	3	4	5	6
	OLS	IV	OLS	IV	OLS	IV
Real Credit	0.219***	0.234***	0.185***	0.124**	0.197***	0.140*
	[0.043]	[0.047]	[0.045]	[0.053]	[0.067]	[0.079]
Real Expenditure	0.503***	0.417	0.695***	0.777***	0.129	0.578
	[0.179]	[0.290]	[0.211]	[0.293]	[0.351]	[0.633]
Real Credit * High SOE profit	-0.039	-0.098				
	[0.038]	[0.060]				
Real Expenditure * High SOE profit	0.387***	0.631**				
	[0.134]	[0.286]				
Real Credit * High House price growth			0.001	0.052		
			[0.029]	[0.047]		
Real Expenditure * High House price growth			0.089	-0.114		
			[0.148]	[0.194]		

Comment 6: Interpretations

Minor Comments

- Robustness checks by excluding some major provinces
- Minor typos
    - Page 19: notes for Figure 5.
    - Page 30: references Gao et al (2017)

Conclusions

- A Highly Recommended Paper!
- Learned a lot by reading It!