Fiscal stimulus, credit frictions and the amplification effects of small firms

Pedro Juarros

Georgetown University

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Motivation

- We care about *output* (Y) after a fiscal stimulus (G)

$$\text{Fiscal Multiplier } (FM) = \frac{\Delta Y}{\Delta G}$$

- Empirical evidence: multipliers can go from as low as 0.5 to larger than 2 (Ramey, 2011; Auerbach & Gorodnichenko, 2012)

- **No such a thing as a unique fiscal multiplier, it depends on the characteristics of the economy**

Motivation

- Firm dynamics facts: **small firms** $\neq$ **large firms**

  1. Contribute disproportionately to output growth (Haltiwanger et al, 2014)
  2. Cyclically more sensitive than large firms (Fort et al, 2013)
  3. Different investment, revenues and financing dynamics along the business cycle (Dinlersoz et al, 2019)

Research question

Given these empirical facts about heterogeneity across small and large firms,

- **How does firm size heterogeneity affect the fiscal multiplier?**
- **Are fiscal spillover effects heterogeneous by firm size?**

Main Contributions

1. Novel determinant: the local FM increases with the share of small firms
   - Neoclassical and NK theories: representative firm (Ramey19'; Nakamura & Steisson14')
2. Positive spillovers for small firms and neutral for large firms
   - Small firms increase operating revenues, investment and financing relative to large firms $\rightarrow$ challenge the established view that $\uparrow$ G crowd-out investment and credit (Auerbach et al, 2020; Murphy & Walsh, 2018)
3. Heterogeneous firms' credit frictions and fiscal stimulus
4. National fiscal multiplier and the share of small firms

Proposed mechanism: Financial Accelerator

Outline

1. Macro evidence: output responses to G shocks at MSA level, (γ^{macro})

2. Micro evidence: firm level responses to local fiscal stimulus, (γ^{micro})

3. Model to quantitatively assess the proposed mechanism and provide a link between national fiscal multipliers and small firms (γ^{nat})

1. Macro evidence: MSA level responses

How does firm size heterogeneity affect the local fiscal multiplier?

$$\frac{Y_{m,t+1}-Y_{m,t-1}}{Y_{m,t-1}} = \beta \frac{G_{m,t+1}-G_{m,t-1}}{Y_{m,t-1}} + \gamma \frac{G_{m,t+1}-G_{m,t-1}}{Y_{m,t-1}} \times (S_{m,t-1}-\bar{S}) + \eta S_{m,t-1} + \delta_m + \delta_t + \epsilon_{m,t}$$

- $Y_{m,t}$: real GDP of MSA m (BEA),
- $G_{m,t}$: federal DOD contracts allocated to MSA m, (Demyanyk et al, 2019)
  - 50% of discretionary G and 18% of G
- $S_{m,t-1}$ log-employment share of small firms, and $\bar{S} = \sum_m^M \sum_t^T \frac{S_{m,t}}{n_M n_T}$, ($<$ 250 employees - Business Dynamic Statistics)
- Interpretation: $\beta + \gamma$ is the local FM of increasing the employment share of small firms by 1% above the average

Identification assumptions

- IV: heterogeneous sensitivity across MSA's to variation in federal (aggregate) military spending (s_m):

$$s_m \frac{G^{agg}_{t+1} - G^{agg}_{t-1}}{Y_{m,t-1}}$$

$s_m = \sum_t^T (G_{m,t}/G_t)/n_T$

- IV: 20-year lagged firm entry ($S^{new}_{m,t-20}$) (Gourio et al, 2016)

  Exclusion restriction: correlation between s_m and $S^{new}_{m,t-20}$ is -0.005 (p-value = 0.72)
  First stage coeff: 0.08**

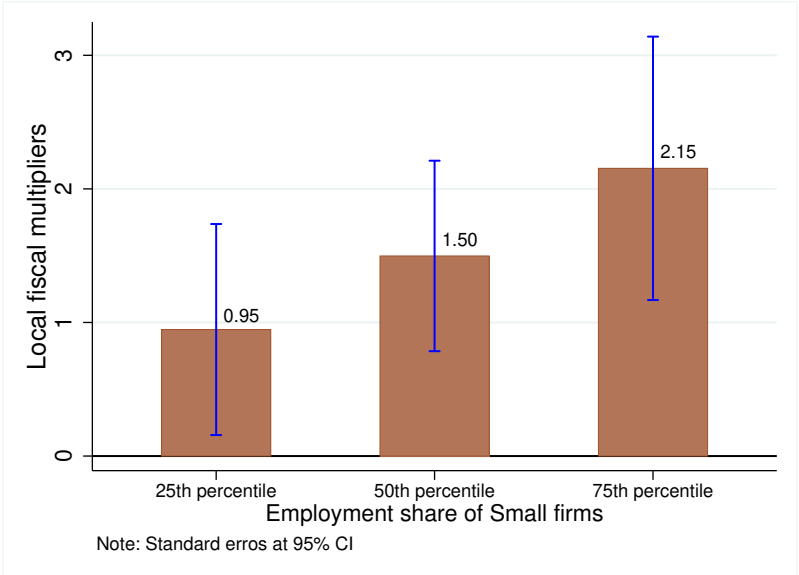
How does firm size heterogeneity affect the local fiscal multiplier?

$$\frac{Y_{m,t+l} - Y_{m,t-1}}{Y_{m,t-1}} = \beta \frac{G_{m,t+l} - G_{m,t-1}}{Y_{m,t-1}} + \gamma \frac{G_{m,t+l} - G_{m,t-1}}{Y_{m,t-1}} \times (S_{m,t-1} - \bar{S}) + \eta S_{m,t-1} + \delta_m + \delta_t + \epsilon_{m,t}$$

Output response at	1-year	2-years
	(1)	(2)
Military contracts (β)	1.573***	1.442***
	(0.369)	(0.380)
Military contracts $\times$ Emp share of Small (γ)	0.068**	0.077**
	(0.028)	(0.038)
Emp share of Small (η)	0.101**	0.077
	(0.040)	(0.062)
Obs.	3,784	3,440
MSA and Time FE	Yes	Yes
Cluster SE	MSA	MSA
1st Stage F-stat	18.41	22.78

Robustness | Adding Controls | Others definitions | Impact on other outcomes

How does firm size heterogeneity affect the local fiscal multiplier?



Does fiscal stimulus ease small firms' constraints?

$$\frac{Y_{m,t+1} - Y_{m,t-1}}{Y_{m,t-1}} = \beta \frac{G_{m,t+1} - G_{m,t-1}}{Y_{m,t-1}} + \delta_m + \delta_t + \epsilon_{m,t}$$

Dependent variable	Firm's Exit rate		
	All	**Small**	Large
	(1)	(2)	(3)
Military contracts (β)	-0.936*	**-1.006****	0.727
	(0.495)	(0.441)	(1.720)
Obs.	3,784	3,784	3,784
MSA and Time FE	Yes	Yes	Yes
SD Cluster	MSA	MSA	MSA
1st Stage F-stat	6.742	6.742	6.742

Note: ***: p<0.01 ;**: p<0.05;*: p<0.1

Does fiscal stimulus ease small firms' constraints?

$$\frac{Y_{m,t+1} - Y_{m,t-1}}{Y_{m,t-1}} = \beta \frac{G_{m,t+1} - G_{m,t-1}}{Y_{m,t-1}} + \delta_m + \delta_t + \epsilon_{m,t}$$

Dependent variable	Firm's Exit rate			House Prices
	All	**Small**	Large	**Prices**
	(1)	(2)	(3)	(4)
Military contracts (β)	-0.936*	**-1.006****	0.727	**1.251***
	(0.495)	(0.441)	(1.720)	(0.681)
Obs.	3,784	3,784	3,784	3,652
MSA and Time FE	Yes	Yes	Yes	Yes
SD Cluster	MSA	MSA	MSA	MSA
1st Stage F-stat	6.742	6.742	6.742	7.791

Note: ***: p<0.01 ;**: p<0.05;*: p<0.1

2. Micro evidence: Firm level responses

Are spillover effects heterogeneous by firm size?

- Firm panel data from ORBIS with both, **small and large**, unlisted and listed firms for 1997-2016
- Spillovers: firms that **did not receive a military contract**
  - Match contract level data from *USAspending.org* with ORBIS
- G shock: federal military contracts aggregated at state level
- Firm i in state s headquartered on the state where the fiscal stimulus takes place (Cohen et al, 2011; Kim & Nguyen, 2020)

Small firms are different from large firms and military contractors

	Small	Large	Contractors
Employment	43	1,836	1,965
Log Total Assets	15.32	19.33	19.41
Growth Op. Revenues (%)	11.28	10.75	8.51
Investment	-0.02	0.08	0.07
Leverage	0.52	0.57	0.50
Financial leverage	0.20	0.28	0.22
Borrowing cost (%)	4.82	3.30	2.73

Are spillover effects heterogeneous by firm size?

$$\Delta y_{i,s,t} = \alpha_i + \alpha_{s,t} + \gamma \frac{G_{s,t} - G_{s,t-2}}{Y_{s,t-2}} \times Small_{i,s,t-2} + \theta X_{i,s,t-2} + \epsilon_{i,s,t}$$

- $\Delta y_{i,s,t}$ is a two year log-change in Operating Revenues, Investment and Financing; SE clustered at state level
- IV: heterogeneous sensitivity (s_s)

$$\frac{G_{s,t} - G_{s,t-2}}{Y_{s,t-2}} = s_s \times \frac{G_t - G_{t-2}}{Y_{t-2}}$$

- α_i: firm fixed effects (i.e. industry) and $\alpha_{s,t}$: state-year fixed effects; $X_{i,s,t-2}$: firm level controls (Log total assets, EBIT)
- $Small_{i,s,t-2}$: dummy equal to 1 if firms have less than 250 employees before shock

Are spillover effects heterogeneous by firm size?

	Op. Revenues growth (1)	Investment (Δ Fixed Assets) (2)	Total Financing growth (3)
$\Delta G \times$ Small (γ)	11.168**	4.978**	7.550***
	(4.552)	(2.173)	(2.624)
Small	0.046***	0.016	0.010
	(0.013)	(0.025)	(0.017)
Log Total Assets	-0.173***	-0.326***	-0.203***
	(0.007)	(0.007)	(0.009)
Profitability	-0.021	0.097***	0.060***
	(0.013)	(0.019)	(0.008)
Firm FE	Yes	Yes	Yes
State $\times$ Year FE	Yes	Yes	Yes
Obs	59,411	61,010	62,054
Cluster SE	State	State	State
Kleibergen-Paap rk Wald F	45.64	41.88	43.15

Including Contractors | Sample selection | Small & Medium | Average firm

Taking stock of the evidence

- **Macro:** the local fiscal multiplier increases with the share of small firms,

$$\gamma^{macro} > 0$$

- **Micro:** small firms *increase operating revenues, investment and financing* relative to large firms,

$$\gamma^{micro} > 0$$

- **Proposed mechanism**

  Stimulus improve small firms' balance sheet and the value of the collateral, reducing credit spreads that leads to an increase in borrowing and investment

3. Model

$\gamma^{macro} > 0?$ $\gamma^{micro} > 0?$ $\gamma^{nat} > 0?$

Model: Financial accelerator (BGG99) + Open economy New Keynesian model (NS14)

1. **Two regions, $i = H, F$ (a small home region, H, (n) and a larger "rest of the union", F, $(1 - n)$)**
2. Credit friction ($R^K \geq R$), R risk-free interest rate;
3. **Two types of firms: Small and Large, which differ in the riskiness of investment projects, leverage and credit spreads**
4. Households (HHs): consume ($C = (C_H, C_F)$), supply labor (H) and deposit savings in financial intermediary (D);
5. Financial intermediary: are competitive, take deposits from HHs and lend to firms;
6. (Federal) Government: lump-sum taxes (T), spending in each region (G_i) and Monetary policy rule;

Model - Credit friction

- Firm's finance investment with internal (N) and external funds (B): $B_{jt+1} = P_{jkt} K_{jt+1} - N_{jt+1}$, with $j = s, l$
- Idiosyncratic shock: $F(\omega_j)$ with $j = s, l$ and $\sigma^2_{\omega,s} > \sigma^2_{\omega,l}$
- ω is private information, Lender must pay μ to observe ω
- Optimal contract is $\bar{\omega}$ such that:

$$\bar{\omega}_{jt} R^K_{jt} P_{k,jt-1} K_{jt} = Z_{jt} B_{jt}$$

Model - Credit friction

- Firm's problem (E1):

$$\underset{\{K_{jt},E_{t-1}\bar{\omega}_{jt}\}}{Max} E_{t-1}\int_{\bar{\omega}_{jt}}^{\infty}\left[\omega_j R_{jt}^K P_{kjt}K_{jt-1} - Z_{jt}B_{jt}\right]dF(\omega_j)$$

subject to,

$$R_t(P_{k,jt-1}K_{jt} - N_{jt}) = \left[\bar{\omega}_{jt}\int_{\bar{\omega}_{jt}}^{\infty} f(\omega_j)d\omega_j + (1-\mu_j)\int_0^{\bar{\omega}_{jt}}\omega_j f(\omega_j)d\omega_j\right]R_{jt}^K P_{kjt-1}K_{jt}$$

- Let

$$\left[\bar{\omega}_{jt}\int_{\bar{\omega}_{jt}}^{\infty} f(\omega_j)d\omega_j + (1-\mu_j)\int_0^{\bar{\omega}_{jt}}\omega_j f(\omega_j)d\omega_j\right] = \left[\frac{1}{\Gamma(\bar{\omega}_{jt+1}) - \mu_j A(\bar{\omega}_{jt+1})}\right]$$

- Capital expenditures are proportional to firm's net worth

$$E_t\left[\frac{R_{jt+1}^K}{R_t}\right] = E_t\left[\frac{1}{\Gamma(\bar{\omega}_{jt+1}) - \mu_j A(\bar{\omega}_{jt+1})}\left(1 - \left(\frac{P_{kjt}K_{jt+1}}{N_{jt+1}}\right)^{-1}\right)\right]$$

Definition of equilibrium

- Given $F(\omega_j)$, a competitive equilibrium is a sequence of allocation and price functions, $\{C_{it}, C^e_{it}, H_{ijt}, D_{it}, W_{it}, Y_{ijt}, K_{ij,t+1}, B_{ijt}, P_{kijt}, R^K_{ij,t+1}, R_{t+1}, G_{it}, T_t, \bar{\omega}_{ijt}\}_{t=0}^{\infty}$, for $i = H, F$ and $j = s, l$; such that:

1. Household solve $\underset{\{C_{t+j}, H_{t+j}, D_{t+j}\}}{Max} E_t \sum_{j=0}^{\infty} \beta^j U(C_{t+j}, H_{t+j})$ s.t.,
   $P_t C_t + D_{t+1} = W_t H_t + R_t D_t - T_t + \Pi_t$
2. Entrepreneur j solves $E1$;
3. Capital producers solve $\underset{\{K_{jt+1}, I_{jt}\}}{Max} E_0 \sum_{t=0}^{\infty} \beta^t [P_{jkt} K_{jt} - I_{jt} - \tilde{P}_{jkt} K_{jt}]$ s.t.
   $K_{jt+1} = \phi_j\left(\frac{I_{jt}}{K_{jt}}\right) K_{jt} + (1-\delta) K_{jt}$
4. Government budget: $nP_{Ht} G_{Ht} + (1-n) P_{Ft} G_{Ft} = T_t$
5. $Y_t = nY_{Ht} + (1-n) Y_{Ft}$;
   $Y_{it} = C_{it} + I_{it} + G_{it} + \sum_j \mu_j \int_0^{\bar{\omega}_{jt}} \omega_j dF(\omega_j) R^K_{jt} P_{jk,t-1} K_{jt}$;
   $C_t = [n(C_{it} + C^e_{it}) + (1-n)(C^*_{it} + C^{e*}_{it}]$; $I_t = [nI_{it} + (1-n) I^*_{it}]$
6. $\sum_j (Q_{ijt} K_{ij,t+1} - N_{ij,t+1}) = \sum_j B_{ij,t+1} = D_{it+1}$

Parametrization

		Target/Source	All	
Discount factor	β	2% i^n	0.995	
Labor share	α		0.65	
Substituibility home and foreign goods	η	NS14'	2	
Substituibility varieties	θ	NS14'	7	
Depreciation	δ		0.02	
Relative size of avg. MSA	n	BEA	0.01	
Home bias	ϕ_H	Dupor et al, 19'	0.66	
Taylor rule, Calvo parameter	$(\phi_\pi, \phi_Y, \epsilon)$	Iacovello, 05'	(1.27,0.13,0.75)	
Gov. Spending, Shock persistence	$(G/Y, \delta)$	Basso&Rachedi, 20'	(0.20,0.95)	
Financial Accelerator & Firm size		Target/Source	Small	Large
Emp. share		BDS	46%	54%
Steady-state risk spread (annual)(^{m})	R^K/R	ORBIS	3%	1%
Business failure (annual) (^{m})	$F(\bar{\omega})$	BDS	7%	1%
Leverage ratio (^{m})	B/N	ORBIS	0.52	0.57
Entrepreneurial Labor share (^{m})	Ω	BGG99'	0.01	0.01
Capital Adjustment Cost	ϕ	Match (σ_s^I/σ_I^I)	0.1	0.5
Standard error of idiosyncratic shock*	σ_ω		0.300	0.197
Threshold value of idiosyncratic shock*	$\bar{\omega}$		0.457	0.568
Monitoring cost*	μ		0.091	0.134
Survival rate of entrepreneurs*	γ_s		0.979	0.988
Elast. of risk premium wrt leverage	ν	Deduced at SS	0.045	0.025

Model vs Data: Investment response (γ^{micro})

	Data	Model
Difference in Investment response (γ^{micro})	4.978	3.202
Investment: Ratio of Model-Data explained	**64.3%**	

Model vs Data: γ^{macro}

$$\frac{Y_{m,t+1} - Y_{m,t-1}}{Y_{m,t-1}} = \beta \frac{G_{m,t+1} - G_{m,t-1}}{Y_{m,t-1}} + \gamma \frac{G_{m,t+1} - G_{m,t-1}}{Y_{m,t-1}} \times (S_{m,t-1} - \bar{S}) + \eta S_{m,t-1} + \delta_m + \delta_t + \epsilon_{m,t}$$

Create model simulated data changing two parameters:

1. $G_m = [G_{min}, G_{max}]$ and 2. $S_m = [S_{min}, S_{max}]$

		Data	Model
Average Local Output Fiscal Multiplier	β	1.573	1.707
Sensitivity wrt Small firms	γ^{macro}	0.068	0.010
Δ Local Multiplier of 1% increase in Share of Small	γ/β	4.32%	0.56%
Local Fiscal Multiplier: Ratio of Model-Data explained		**13.1**%	
[Min; Max]		[10.2%; 17.0%]	

National multiplier and Small firms - γ_{nat}

- Policymakers care about the national fiscal multiplier

$$Y_t^{nat} = nY_{Ht} + (1-n)Y_{Ft} \quad \& \quad G_t^{nat} = nG_{Ht} + (1-n)G_{Ft}$$
$$S_t^{nat} = nS_{Ht} + (1-n)S_{Ft}$$

- National policies come into play now ...

- Does a higher share of small firms also increase the national aggregate multiplier? $\gamma_{nat} > 0$?

National multiplier and Small firms - γ_{nat}

- Does a higher share of small firms also increase the national aggregate multiplier? $\gamma_{nat} > 0$?

$$\frac{Y^{nat}_{t+1} - Y^{nat}_{t-1}}{Y^{nat}_{t-1}} = \beta_{nat} \frac{G^{nat}_{t+1} - G^{nat}_{t-1}}{Y^{nat}_{t-1}} + \gamma_{nat} \frac{G^{nat}_{t+1} - G^{nat}_{t-1}}{Y^{nat}_{t-1}} \times (S^{nat}_{t-1} - \bar{S}^{nat}) + \eta S^{nat}_{t-1} + \epsilon_t$$

National multiplier and Small firms - γ_{nat}

- Does a higher share of small firms also increase the national aggregate multiplier? $\gamma_{nat} > 0$?

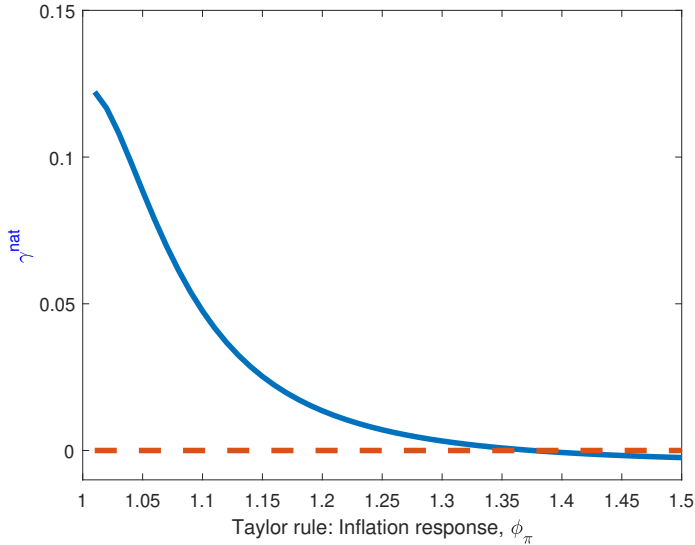
$$\frac{Y^{nat}_{t+1} - Y^{nat}_{t-1}}{Y^{nat}_{t-1}} = \beta_{nat} \frac{G^{nat}_{t+1} - G^{nat}_{t-1}}{Y^{nat}_{t-1}} + \gamma_{nat} \frac{G^{nat}_{t+1} - G^{nat}_{t-1}}{Y^{nat}_{t-1}} \times (S^{nat}_{t-1} - \bar{S}^{nat}) + \eta S^{nat}_{t-1} + \epsilon_t$$

- **Answer:** $\gamma^{nat} = f(\phi_\pi)$

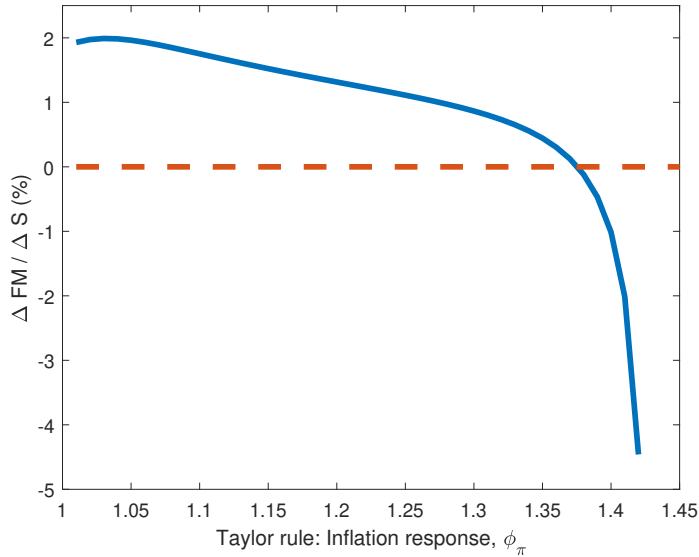
$$\hat{R}_t = (1 - \rho_R)\phi_\pi \hat{\pi}_t + \rho_R \hat{R}_{t-1}$$

The larger the stabilization, the smaller the role of the financial accelerator

National multiplier and Small firms - γ_{nat}



National multiplier and Small firms - γ_{nat}/β_{nat}



Conclusions

1. Local fiscal multiplier increases with the share of small firms, implying multipliers of 0.95-2.15 in the interquantile range ($\gamma^{macro} > 0$)

2. Positive spillovers for small firms and neutral for large firms:
   - Small firms increase operating revenues, investment and financing by 5%-10% relative to large firms ($\gamma^{micro} > 0$)

3. Heterogeneity in firms' credit frictions shape the effectiveness of fiscal stimulus

4. Financial accelerator mechanism can account for $2/3$ of the heterogeneous response in investment and 10-20% of the sensitivity of the local fiscal multiplier to the share of small firms

5. National fiscal multiplier increases with the share of small firms iff monetary policy does not respond much: $\gamma^{nat} < 0$ in Volcker-Greenspan era and $\gamma^{nat} > 0$ at ZLB

Robustness

Output response	OLS	$(S_{m,t-1} - \bar{S}_t)$	No IV Share Small	MSA specific Cyclicality	National specific Cyclicality
	(1)	(2)	(3)	(4)	(5)
Military contracts (β)	0.213***	1.689***	1.476***	1.334***	1.640***
	(0.079)	(0.425)	(0.405)	(0.263)	(0.359)
Military contracts $\times$ Emp share of Small (γ)	0.007	0.076**	0.048**	0.046**	0.073***
	(0.004)	(0.035)	(0.024)	(0.022)	(0.025)
Emp share of Small (η)	0.123***	0.010**	0.106***	0.027	0.081
	(0.037)	(0.040)	(0.039)	(0.040)	(0.054)
Lag GDP growth				0.432**	
				(0.184)	
Lag GDP growth $\times$ Emp share of Small				0.000	0.003
				(0.001)	(0.008)
Obs.	3,748	3,748	3,748	3,440	3,440
MSA and Time FE	Yes	Yes	Yes	Yes	Yes
Cluster SE	MSA	MSA	MSA	MSA	MSA
1st Stage F-stat		15.88	20.70	17.58	17.49

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Robustness: Adding time-variant controls

Output response	Lagged GDP growth (1)	Control Unemp. rate (2)	Control Share Manuf. (3)	Control Share Constr. (4)	Control House Prices (5)
Military contracts (β)	0.002	1.463***	1.446***	1.404***	1.506***
	(0.195)	(0.333)	(0.315)	(0.321)	(0.378)
Military contracts $\times$ Emp share of Small (γ)	0.020	0.078***	0.063**	0.071***	0.070**
	(0.021)	(0.024)	(0.027)	(0.026)	(0.028)
Emp share of Small (η)	0.074***	0.108**	0.099**	0.106**	0.103**
	(0.025)	(0.042)	(0.040)	(0.043)	(0.040)
Control ($X_{m,t-1}$)		-0.001	-0.016	0.017	-0.002*
		(0.002)	(0.019)	(0.017)	(0.014)
Obs.	3,440	3,608	3,734	3,327	3,674
MSA and Time FE	Yes	Yes	Yes	Yes	Yes
Cluster SE	MSA	MSA	MSA	MSA	MSA
1st Stage F-stat	17.18	22.26	38.20	31.09	17.07

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Robustness: Other definitions of Small

Output response	Small < 50 (1)	Small < 100 (2)	Young < 5 (3)	Large > 1000 (4)
Military contracts (β)	1.460***	1.519***	1.201***	1.065***
	(0.379)	(0.364)	(0.257)	(0.388)
Military contracts $\times$ Emp share of Small (γ)	0.042**	0.053**	0.029***	-0.052†
	(0.019)	(0.022)	(0.009)	(0.032)
Emp share of $Small_{50}$	0.125***			
	(0.041)			
Emp share of $Small_{100}$		0.102**		
		(0.043)		
Emp share of $Young_5$			-0.017	
			(0.013)	
Emp share of $Large_{1000}$				-0.009
				(0.041)
Obs.	3,748	3,748	3,748	3,748
MSA and Time FE	Yes	Yes	Yes	Yes
Cluster SE	MSA	MSA	MSA	MSA
1st Stage F-stat	15.78	17.10	7.89	6.46

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Impact on other outcomes

Response of	Earnings	Wages	Personal Income	Unempl rate	Dividends, Int. & rent
	(1)	(2)	(3)	(4)	(5)
Military contracts (β)	2.154***	1.934***	1.058***	-2.113**	0.691**
	(0.440)	(0.404)	(0.258)	(0.834)	(0.321)
Military contracts $\times$ Emp share of Small (γ)	0.078**	0.096***	0.036*	-0.019	0.044
	(0.033)	(0.025)	(0.020)	(0.076)	(0.033)
Emp share of Small (η)	0.105**	0.075**	0.045	0.179	-0.078
	(0.040)	(0.038)	(0.028)	(0.160)	(0.048)
Obs.	3,748	3,748	3,748	3,608	3,748
MSA and Time FE	Yes	Yes	Yes	Yes	Yes
Cluster SE	MSA	MSA	MSA	MSA	MSA
1st Stage F-stat	18.41	18.41	18.41	21.83	18.41

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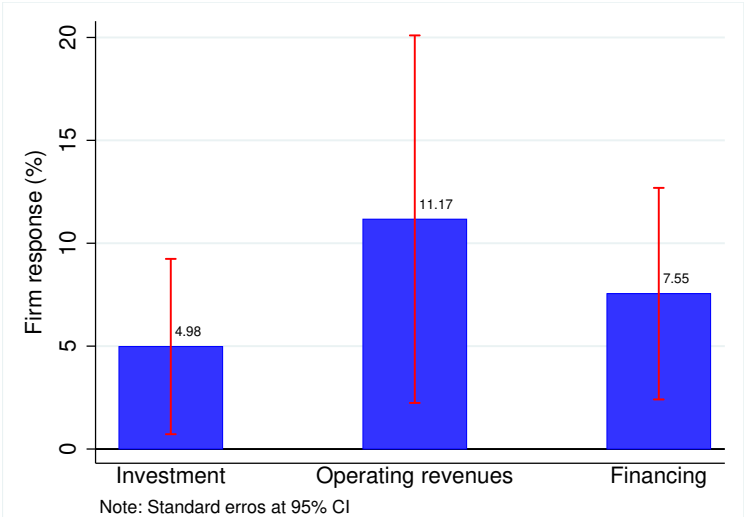
Are spillover effects heterogeneous by firm size?

Response of Small relative to Large firms: γ



Adding Contractors

	Op. Revenues growth (1)	Investment (Δ Fixed Assets) (2)	Total Financing growth (3)
$\Delta G \times$ Small (γ)	11.230***	3.809	8.044***
	(2.924)	(2.722)	(2.615)
Small	0.047***	0.015	0.003
	(0.012)	(0.022)	(0.016)
Log Total Assets	-0.172***	-0.321***	-0.200***
	(0.007)	(0.007)	(0.010)
Profitability	-0.010	0.140***	0.074***
	(0.014)	(0.018)	(0.008)
Firm FE	Yes	Yes	Yes
State $\times$ Year FE	Yes	Yes	Yes
Obs	70,708	72,343	73,556
Cluster SE	State	State	State
Kleibergen-Paap rk Wald F	42.94	42.50	44.02

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Sample selection

Firms that were in the sample for more than 5 years

	Op. Revenues growth (1)	Investment (Δ Fixed Assets) (2)	Total Financing growth (3)
$\Delta G \times$ Small (γ)	11.311**	6.520**	9.009**
	(4.487)	(2.525)	(3.404)
Small	0.043***	0.006	-0.005
	(0.012)	(0.031)	(0.019)
Log Total Assets	-0.162***	-0.305***	-0.194***
	(0.005)	(0.008)	(0.010)
Profitability	-0.033	0.163***	0.086***
	(0.020)	(0.023)	(0.011)
Firm FE	Yes	Yes	Yes
State × Year FE	Yes	Yes	Yes
Obs	49,270	50,185	50,687
Cluster SE	State	State	State
Kleibergen-Paap rk Wald F	38.84	38.64	39.75

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Robustness: Small & Medium firms

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	Operating Revenues growth	Investment (Δ Fixed Assets)	Total Financing growth
$\Delta G \times \text{Small}_{100}(\gamma_1)$	11.773**	1.727	9.198**
	(4.474)	(3.949)	(3.694)
$\Delta G \times \text{Medium}_{100-250}(\gamma_2)$	12.847***	12.461***	8.721**
	(3.883)	(3.310)	(3.241)
Small_{100}	0.104***	0.024	0.014
	(0.027)	(0.046)	(0.036)
$\text{Medium}_{100-250}$	0.090***	0.028	0.003
	(0.014)	(0.022)	(0.021)
Total Assets	-0.166***	-0.325***	-0.203***
	(0.007)	(0.008)	(0.011)
Profitability	-0.022	0.096***	0.060***
	(0.013)	(0.019)	(0.008)
Firm FE	Yes	Yes	Yes
State $\times$ Year FE	Yes	Yes	Yes
Obs	59,411	61,010	62,054
Cluster SE	State	State	State
Kleibergen-Paap rk Wald F	22.89	23.05	23.80

Effects for the Average firm

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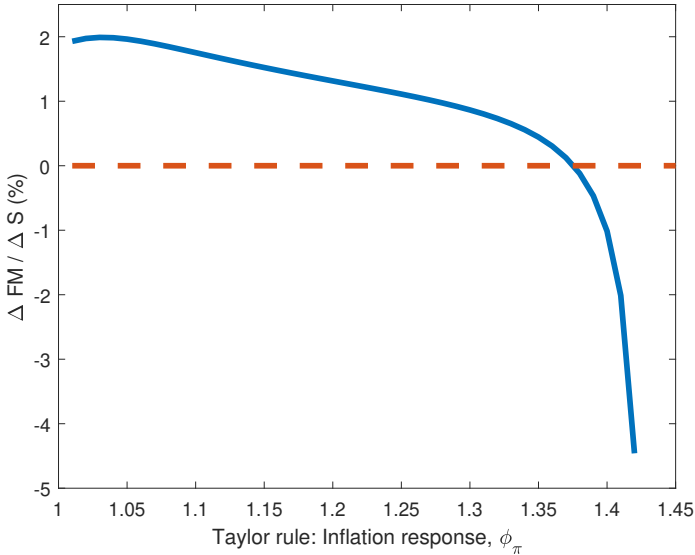
	Op. Revenues growth	Investment (Δ Fixed Assets)	Total Financing growth
ΔG	1.804	-1.205	0.758
	(2.384)	(2.675)	(2.550)
ΔGDP	0.092	0.138	-0.011
	(0.185)	(0.129)	(0.116)
$\Delta Taxes$	-0.128**	-0.087	-0.068
	(0.058)	(0.059)	(0.051)
Small	0.055***	0.019	0.017
	(0.012)	(0.025)	(0.015)
Log Total Assets	-0.177***	-0.327***	-0.204***
	(0.007)	(0.008)	(0.009)
Profitability	-0.020	0.097***	0.061***
	(0.013)	(0.019)	(0.008)
Firm FE	Yes	Yes	Yes
State FE	Yes	Yes	Yes
Obs	59,412	61,011	62,054
Cluster SE	State	State	State
Kleibergen-Paap rk Wald F	4.882	9.338	9.265

National multiplier and Small firms



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