

Subcontracting in Federal Spending: Micro and Macro Implications

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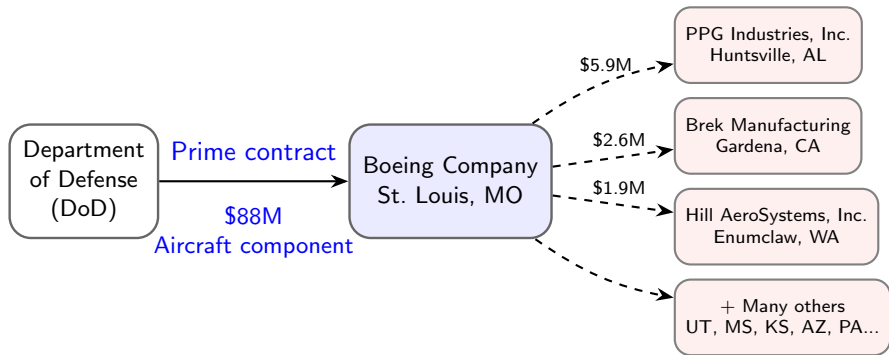
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Motivation

- ▶ Federal prime contracts are broadly exploited as a source of cross-sectional fiscal variation.
 - ▶ **Defense prime contracts** are attractive for identification.
 - ▶ Widely used to estimate local multipliers, study fiscal transmission, explore heterogeneity- and map to aggregate multipliers.
- ▶ Standard assumption: Place of **prime contract** \approx Place of impact
 - ▶ Nakamura & Steinsson (2014): *“An important concern is the extent of interstate **subcontracting**...”*
- ▶ **Our paper:** First systematic empirical analysis of **subcontracting** and its implications for transmission of government spending

What Does Subcontracting Look Like?

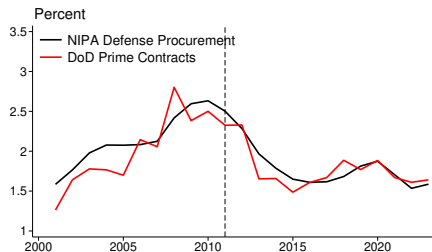


Source: USAspending.gov.

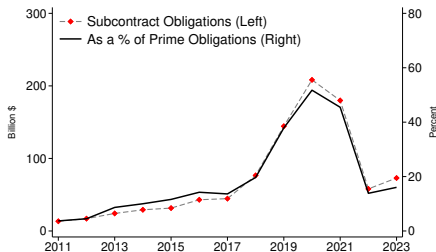
Total subcontracting:
\$22M (25% of prime \$)

- ▶ Subcontracting reporting mandated by Federal Funding Accountability and Transparency Act (FFATA)- signed in 2006- broadly effective from 2011.

Substantial Growth in Defense Subcontracting



Prime contract share of GDP



Subcontract share of prime contracts

- ▶ Defense prime contract spending close to 2% of GDP (10% of G).
- ▶ Subcontract spending accounts for **20%** of prime obligations.
- ▶ 2018-2021 surge: defense buildup/ DoD priorities + policy intentions

This Paper

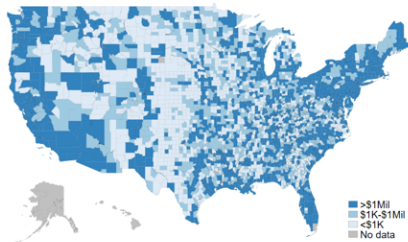
- ▶ **Question:** To what extent does **subcontracting**
 - ▶ reallocate federal spending across geography, industries, and firms?
 - ▶ change the transmission of govt. spending shocks?
- ▶ **Approach:**
 - 0: Link DoD contracts with NETS establishment-level data
 1. Establish key facts about subcontracting reallocation
 2. Revisit local fiscal multipliers
 3. Examine firm-level responses to prime and subcontracts
- ▶ **Main results:**
 - ▶ Conventional **prime-contract** multipliers not materially affected
 - ▶ **Subcontract** multipliers much smaller than prime-contract multipliers
- ▶ **Implications:** The rise of subcontracting is expected to weaken the transmission of government spending shocks

Stylized Facts:

Spending Reallocation through Subcontracting

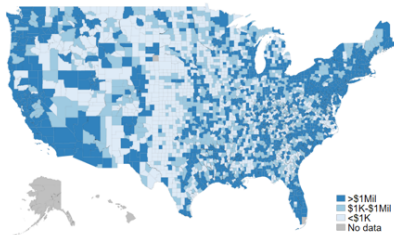
Fact 1. Geographic Reallocation

Prime Award \$, 2019

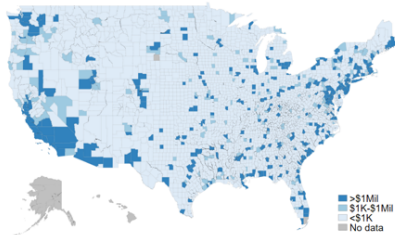


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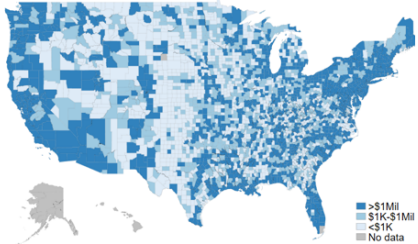


Sub Award Outflow \$, 2019

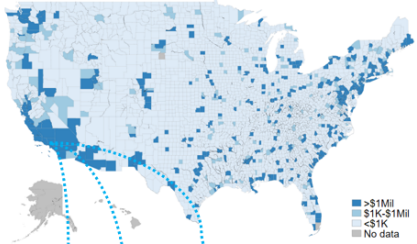


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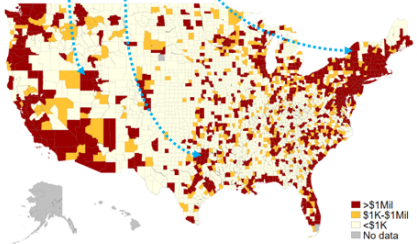
Prime Award \$, 2019



Sub Award Outflow \$, 2019

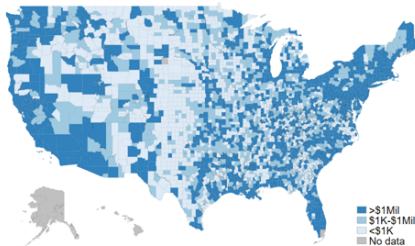


Sub Award Inflow \$, 2019

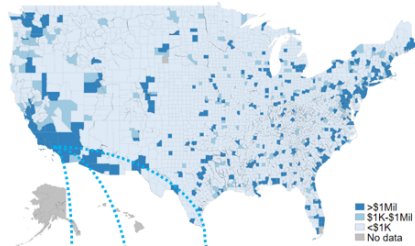


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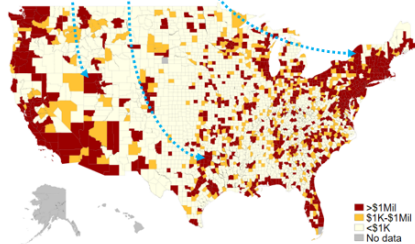
Prime Award \$, 2019



Sub Award Outflow \$, 2019



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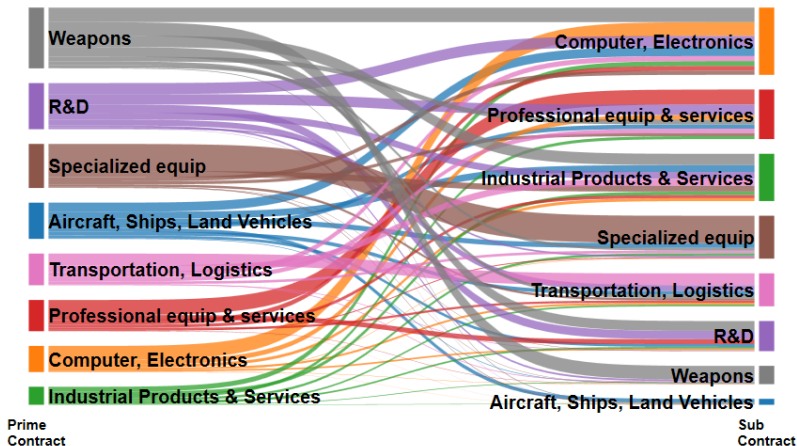


Prime and subcontract performance location:

Different County	Different State	Different Region	# Obs.
90%	71%	39%	1.4 Mil

Fact 2. Cross-Industry Reallocation

What do prime and subcontracts deliver:



- ▶ **Prime contracts (left):** Weapons, R&D, Spec. equip, Aircraft/Ships
- ▶ **Subcontracts (right):** Variety of products from broader industries

Fact 2. Cross-Industry Reallocation:

Subcontracting shifts spending toward manufacturing

Subcontractors → Prime contractors ↓	Construction	Mfg	Trade	High-Valued Services	Other Services	To Goods
Construction	69%	9%	11%	7%	4%	78%
Mfg	2%	80%	6%	9%	3%	82%
Trade	1%	64%	15%	16%	4%	65%
High-Valued Services	4%	18%	5%	66%	7%	22%
Other Services	17%	18%	8%	36%	21%	35%
Overall						65%

Notes: Each row shows values accounted for by subcontractors in a given industry. High-valued service industries include information, finance, profession, business and technical services, and education and health.

Fact 3. Cross-Firm Reallocation:

Subcontracting shifts spending toward large firms

Subcontractors →	≤19 employees	20-49	50-99	100-299	≥ 300 employees	To Large (≥ 50 employees)
Prime contractors ↓						
≤ 19 employees	24%	18%	14%	18%	26%	58%
20-49	24%	21%	13%	26%	17%	55%
50-99	25%	21%	16%	18%	19%	53%
100-299	24%	19%	13%	20%	25%	57%
≥ 300 employees	13%	11%	8%	25%	43%	76%
Overall						65%

Notes: This table shows the share of subcontract obligations (in dollars) flowing from prime contractors in each firm-size category to subcontractors in a given category. Within-category shares are highlighted in bold. Firm-size information is drawn from NETS.

Implications of Subcontracting Reallocation

- ▶ Stylized facts show:
 - ▶ Widespread geographic reallocation
 - ▶ Subcontracting shifts spending toward large, manufacturing firms
- ▶ Why this matters:
 1. Bias in conventional local multiplier estimates
 2. New estimates on subcontracting effects
 3. How to explain the differential effects, if any?

Implications of Subcontracting Reallocation

- ▶ Stylized facts show:
 - ▶ Widespread geographic reallocation
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- ▶ Why this matters:
 1. Bias in conventional local multiplier estimates \Leftarrow *County-level evidence*
 2. New estimates on subcontracting effects \Leftarrow *County + Firm-level*
 3. How to explain the differential effects, if any? \Leftarrow *Firm-level evidence*

Estimating Local Fiscal Multipliers: Defense Prime vs. Subcontract Spending

Estimating Local Fiscal Multipliers

- ▶ Conventional approach:

$$\sum_{h=0}^{K-1} \frac{Y_{i,t+h} - Y_{i,t-1}}{Y_{i,t-1}} = \beta_K \sum_{h=0}^{K-1} \frac{G_{i,t+h} - G_{i,t-1}}{Y_{i,t-1}} + \alpha_i + \delta_t + \epsilon_{it}$$

$G_{i,t}$: Defense spending in i based on prime-contract location only

Estimating Local Fiscal Multipliers

- ▶ Conventional approach:

$$\sum_{h=0}^{K-1} \frac{Y_{i,t+h} - Y_{i,t-1}}{Y_{i,t-1}} = \beta_K \sum_{h=0}^{K-1} \frac{G_{i,t+h} - G_{i,t-1}}{Y_{i,t-1}} + \alpha_i + \delta_t + \epsilon_{it}$$

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- ▶ Our approach:

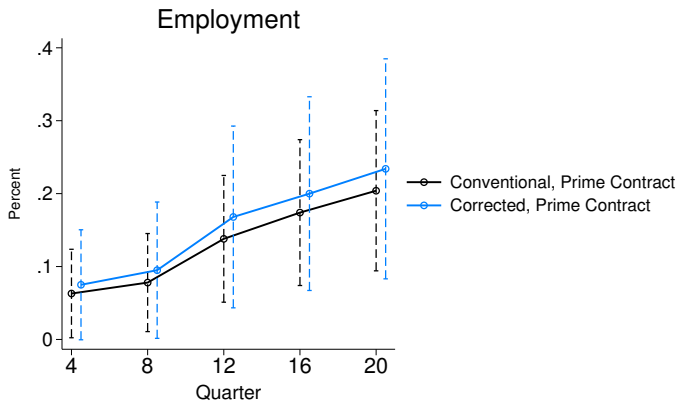
$$\sum_{h=0}^{K-1} \frac{Y_{i,t+h} - Y_{i,t-1}}{Y_{i,t-1}} = \beta_K \underbrace{\sum_{h=0}^{K-1} \frac{G_{i,t+h}^P - G_{i,t-1}^P}{Y_{i,t-1}}}_{\text{Adjusted prime } \mathfrak{S}} + \gamma_K \underbrace{\sum_{h=0}^{K-1} \frac{G_{i,t+h}^S - G_{i,t-1}^S}{Y_{i,t-1}}}_{\text{Subcontract } \mathfrak{S}} + \alpha_i + \delta_t + \epsilon_{it}$$

▶ $G_{i,t}^P := G_{i,t} - \sum_j G_{i,j,t}^{sub} \quad \Leftarrow \text{Adjusted prime spending}$

▶ $G_{i,t}^S := \sum_j G_{j,i,t}^{sub} \quad \Leftarrow \text{Total subcontract spending}$

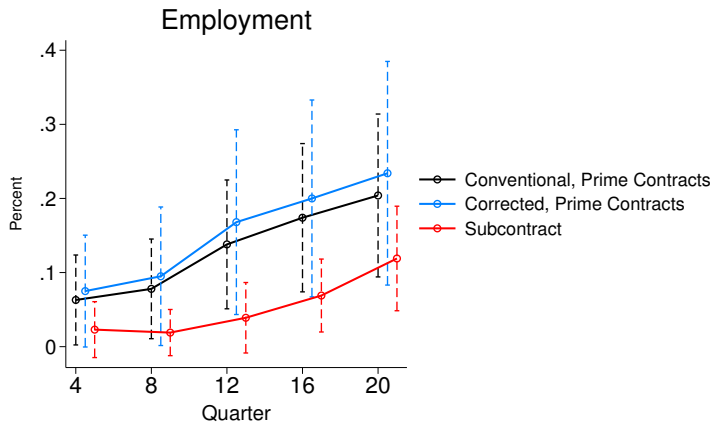
- ▶ Identification by shift-share instruments: $\frac{(G_{t+h}^P - G_{t-1}^P) s_{i,0}^P}{Y_{i,t-1}}, \frac{(G_{t+h}^S - G_{t-1}^S) s_{i,0}^S}{Y_{i,t-1}}$

County-Level IV Estimates of Local Multipliers



- ▶ **Prime-contract** effects slightly higher than prior estimates.

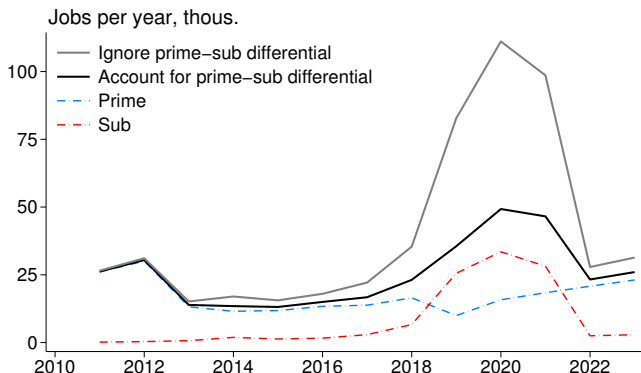
County-Level IV Estimates of Local Multipliers



- ▶ **Prime-contract** effects slightly higher than prior estimates.
- ▶ **Subcontract** effects much smaller than prime-contract effects
- ▶ Similar pattern for **earnings** local multipliers.

Implications for Job Creation

Los Angeles County, CA



- ▶ Ignoring prime-sub differential overstates employment gains
- ▶ Rise of subcontracting weakens transmission of gov. spending

Mechanisms:

Why Do Subcontracts Have Weaker Effects?

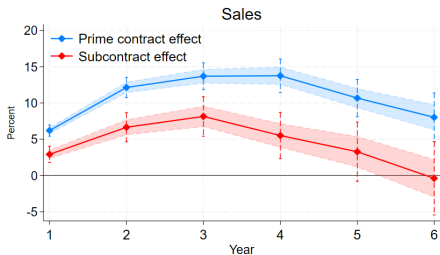
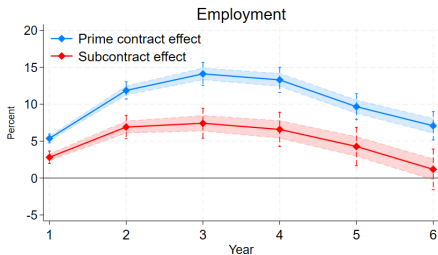
Firm-Level Evidence

- ▶ Consider direct effects on firm outcomes.
- ▶ National Establishment Time Series (NETS), 2011-2022
 - ▶ Firm-level panel data: employment, sales, etc.
 - ▶ Broad coverage \Rightarrow **91%** of DoD contractors can be matched
 - ▶ Apply Barnatchez et al. (2017) restrictions: **44%** of firms matched
- ▶ Event-study empirical design

$$\frac{y_{j,t+h} - y_{j,t-1}}{y_{j,t-1}} = \beta^h g_{j,t}^P + \gamma^h g_{j,t}^S + \omega \mathbf{x}_{j,t-1} + \alpha_j + \delta_{Ind,t} + \nu_{j,t+h},$$

– $g_{j,t}^P$, $g_{j,t}^S$: Indicator or dollar amount received by firm j in year t , for **primes** and **subcontracts**.

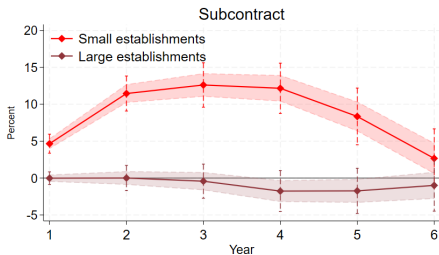
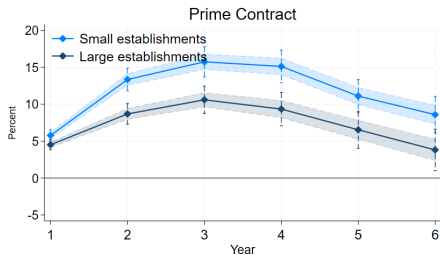
Prime vs. Subcontract Effects



- ▶ Firm responses are **larger** when receiving **prime** contracts
- ▶ Robust to: (1) \$ amount as shock; (2) restricting to firms receiving both contracts; (3) relaxing Barnatchez et al. restrictions.

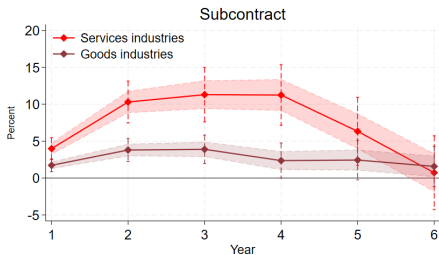
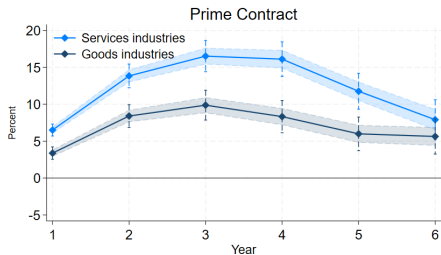
Why Do Subcontracts Have Weaker Effects?

1. Large firms \Rightarrow weaker employment responses



Why Do Subcontracts Have Weaker Effects?

1. Large firms \Rightarrow weaker employment responses
2. Manufacturing firms \Rightarrow weaker employment responses



Why Do Subcontracts Have Weaker Effects?

1. Large firms \Rightarrow weaker employment responses
2. Manufacturing firms \Rightarrow weaker employment responses
3. Subcontracts less stable than prime contracts

	$\mathbb{I}(\text{Prime contract})_t$	$\mathbb{I}(\text{Subcontract})_t$	$\mathbb{I}(\text{Same Prime Firm})_t$
$\mathbb{I}(\text{Prime contract})_{t-1}$	0.210*** (0.002)		
$\mathbb{I}(\text{Subcontract})_{t-1}$		0.116*** (0.002)	
$\mathbb{I}(\text{Same Prime Firm})_{t-1}$			0.223*** (0.007)
$\mathbb{I}(\text{Same Prime Firm})_{t-1} \times \text{Large}$			-0.042*** (0.009)
Ctrls	Y	Y	Y
Firm FE + Ind-Year FE	Y	Y	Y
# Obs.	704,076	307,861	82,113
Sample	Prime firms	Sub firms	Sub firms

- ▶ Prime contract relationship more persistent than subcontract
- ▶ Relationship with main prime contractor is more stable for smaller subcontractors.

Theoretical Framework: Aggregate Multiplier Implications

Theoretical Framework: Aggregate Multiplier Implications

- ▶ Model connects micro facts to aggregate multiplier result:
 - Subcontracting reallocates spending** \Rightarrow **who produces changes**
 \Rightarrow **employment responses change**
- ▶ When do the micro facts imply **subcontract** spending leads to weaker local and aggregate transmission?
- ▶ Two mechanisms are central:
 - ▶ **composition**: subcontract dollars flow to less labor-responsive firms;
 - ▶ **contract frictions**: subcontract relationships are less stable.

Aggregate Implications

- ▶ Aggregate employment response under fixed policy:

$$N_t = \beta(1 - \bar{s}_t)G_t + \gamma\bar{s}_tG_t.$$

- ▶ Hence:

$$\frac{\partial N_t}{\partial G_t} = \beta(1 - \bar{s}_t) + \gamma\bar{s}_t \neq \beta$$

- ▶ Since subcontract effects are smaller, $\gamma < \beta$, higher subcontracting share \bar{s}_t lowers aggregate employment effects of defense spending.
- ▶ **Main takeaway:** subcontracting does not wash out in aggregation because it changes **who produces**, not merely **where dollars are recorded**.

Fiscal Policy in an Era of Uncertainty

Iran War Exposes Shortcomings in U.S. Military Industrial Base

Defense Secretary Pete Hegseth is taking on a problem that the Pentagon and Congress have tried, and mostly failed, to address for years.

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Defense Secretary Pete Hegseth is attempting to take on the shortcomings in the Pentagon's weapons procurement systems while pushing for a \$1.5 trillion budget. Haijun Jiang/The New York Times



By **Julian E. Barnes**

Reporting from Washington

May 19, 2026

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By Seth G. Jones

March 20, 2026 1:41 pm ET



The U.S. Army fires a patriot missile in a test. U.S. ARMY

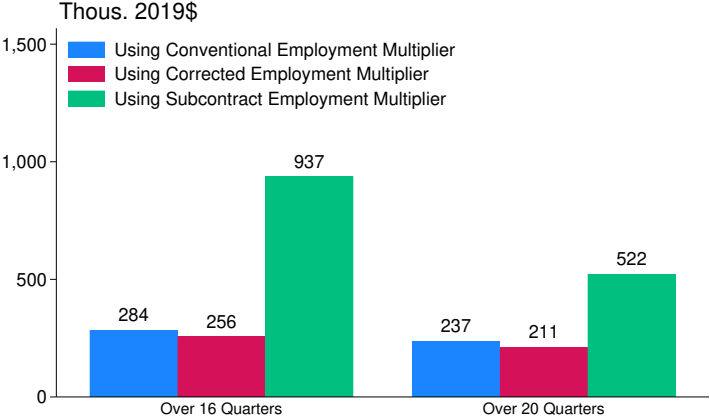
Conclusion

Subcontracting plays an important role in the defense industrial base - and its economic impacts.

- ▶ Subcontracts reallocate federal defense spending
 - ▶ Across **space**, across **industries**, across **firms**...
- ▶ Implications for local multiplier estimates:
 - ▶ Conventional **prime-contract** multipliers not significantly affected
 - ▶ **Subcontracts** have **much smaller** multipliers than **prime-contracts**
- ▶ Explanation for prime-sub differential:
 - ▶ \$ reallocated to large/manufacturing firms w/ weaker employment responses
 - ▶ Subcontracts less predictable, less stable, limiting firm responses
- ▶ **Implications:** Rise of subcontracting likely weakens the transmission of gov. spending shocks

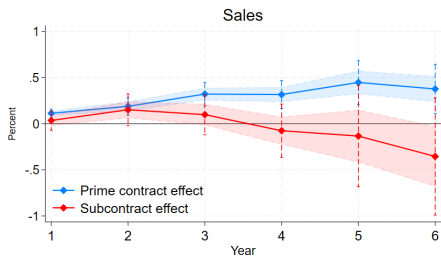
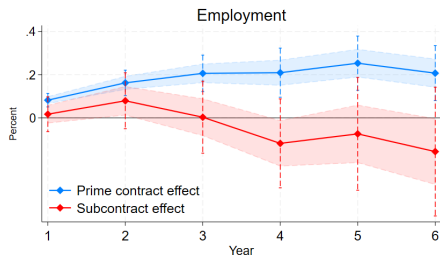
Appendix

County-Level IV Estimates of Cost-per-job-year



Prime vs. Subcontract Effects

- ▶ Robust to using dollar amount as the shock measure



Spending Incidence Through the Network

- ▶ Prime awards in region i :

$$G_{i,t}.$$

- ▶ A share is retained by prime contractors; a share is subcontracted out:

$$P_{i,t} = (1 - s_{i,t})G_{i,t}, \quad S_{i,t}^{out} = s_{i,t}G_{i,t}.$$

- ▶ Subcontract inflows into region i come from other prime locations:

$$S_{i,t}^{in} = \sum_j \theta_{ji,t} s_{j,t} G_{j,t}.$$

- ▶ Local spending incidence is therefore:

$$E_{i,t} = P_{i,t} + S_{i,t}^{in}.$$

- ▶ **Message:** prime awards $G_{i,t}$ are not the same as local spending incidence.

Channel 1: Composition

- ▶ Firms differ in employment responsiveness:

$$\Phi_i^{H'} > \Phi_i^{L'}.$$

H-type firms are more labor-responsive; *L*-type firms are larger, manufacturing-intensive, or capital-intensive.

- ▶ Prime and subcontract spending differ in firm composition:

$$\lambda_P > \lambda_S.$$

Prime spending is more concentrated among high-response firms than subcontract spending.

- ▶ Without contract frictions:

$$\beta_i^0 = \lambda_P \Phi_i^{H'} + (1 - \lambda_P) \Phi_i^{L'},$$

$$\gamma_i^0 = \lambda_S \Phi_i^{H'} + (1 - \lambda_S) \Phi_i^{L'}.$$

- ▶ **Message:** if subcontract dollars go to lower-response firms, then

$$\gamma_i^0 < \beta_i^0.$$

Channel 2: Contract Frictions

- ▶ Firms hire based partly on expected future demand.
- ▶ Prime relationships are more persistent than subcontract relationships:

$$\rho_P > \rho_S.$$

- ▶ This implies stronger employment adjustment to prime contracts:

$$\psi_P^m > \psi_S^m, \quad m \in \{H, L\}.$$

- ▶ With both composition and contract frictions:

$$\beta_i = \psi_P^H \lambda_P \Phi_i^{H'} + \psi_P^L (1 - \lambda_P) \Phi_i^{L'},$$

$$\gamma_i = \psi_S^H \lambda_S \Phi_i^{H'} + \psi_S^L (1 - \lambda_S) \Phi_i^{L'}.$$

- ▶ **Message:** composition explains part of the gap; lower contract stability can keep $\gamma_i < \beta_i$ even after accounting for composition.