
Discussion of ***Subcontracting in Federal Spending***

Micro and Macro Implications

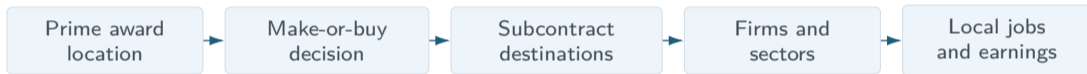
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Motivation

Fiscal spending is assigned to a place, but production is organized through contracts.



- ▶ Standard local multipliers often treat the **prime-contract location** as the final geography of federal demand.
- ▶ The paper asks whether subcontracting breaks that mapping.
- ▶ The macro object is **where demand is produced**, not only where it is awarded.

Research question and answer

Question

When federal procurement is subcontracted, how do **geography**, **producer type**, and **relationship persistence** affect local employment transmission?

Answer

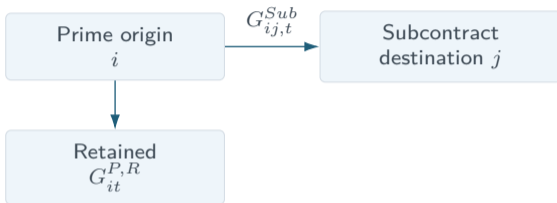
- ▶ Subcontracting reallocates demand across counties, states, sectors, and firm types.
- ▶ Retained prime spending has larger local employment and earnings effects than subcontract inflows.
- ▶ The gap reflects composition and persistence, not only measurement.

Main contributions

1. **Network data.** Link DoD prime contracts to first-tier subcontract records.
2. **Measurement.** Separate retained prime spending from subcontract inflows.
3. **Micro mechanism.** Use establishment-level responses to explain the multiplier gap.
4. **Model.** Rationalize the evidence in a spatial multi-region framework.

A procurement network, not a spending series

- ▶ DoD prime-contract records from USAspending.gov.
- ▶ First-tier subcontract records under FFATA; usable subcontract sample begins in 2011.
- ▶ Links to NETS establishments and QCEW county-industry outcomes.



The key advance is that the data distinguish three objects usually conflated: **award location**, **performance location**, and **recipient establishment**.

Subcontracting changes incidence

94%

of subcontract dollars cross county
lines

78%

cross state lines

57%

cross Census-region lines

Sectoral incidence

- ▶ Manufacturing receives most subcontract obligations.
- ▶ Goods-producing industries receive about two thirds of subcontract value.

Firm-size incidence

- ▶ Subcontracting is not simply large primes passing work to small suppliers.
- ▶ Large firms receive about 62% of subcontract obligations.

Identification: two shift-share instruments

The empirical strategy predicts local procurement shocks by interacting:

initial local exposure \times aggregate national spending shift.

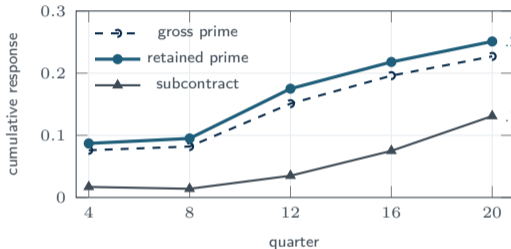
In this paper there are two relevant instruments:

$$Z_{it}^P = s_{i0}^P \Delta G_t^P, \quad Z_{it}^S = s_{i0}^S \Delta G_t^S.$$

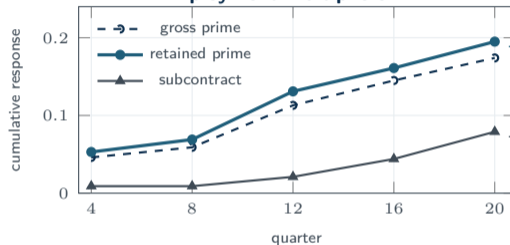
- ▶ s_{i0}^P : county initial exposure to defense prime contracts.
- ▶ s_{i0}^S : county initial exposure to defense subcontracts.
- ▶ ΔG_t^P : national prime-contract spending shift.
- ▶ ΔG_t^S : national subcontracting shift.

Main results

A. Earnings multipliers



B. Employment multipliers



Measurement correction

Corrected prime estimates are only **10–20%** above conventional.

Prime-subcontract gap

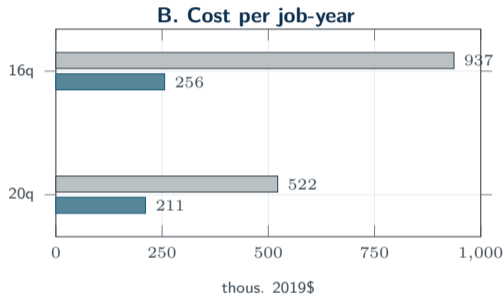
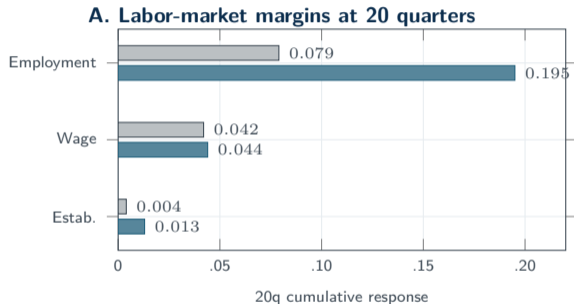
At 20q, subcontract is **52%** of prime earnings and **41%** of prime employment.

Not zero

Subcontract effects are positive at long horizons, but less job-intensive.

Employment incidence: large effects, different job intensity

■ retained prime ■ subcontract



Reading: earnings effects are mainly an employment margin: retained-prime employment is **0.195** at 20q, while subcontract employment is **0.079**. Subcontract dollars still create jobs, but at 20q the implied cost per job-year is **\$522k**, compared with **\$211k** for retained prime.

Micro evidence: why the gaps appears

Composition

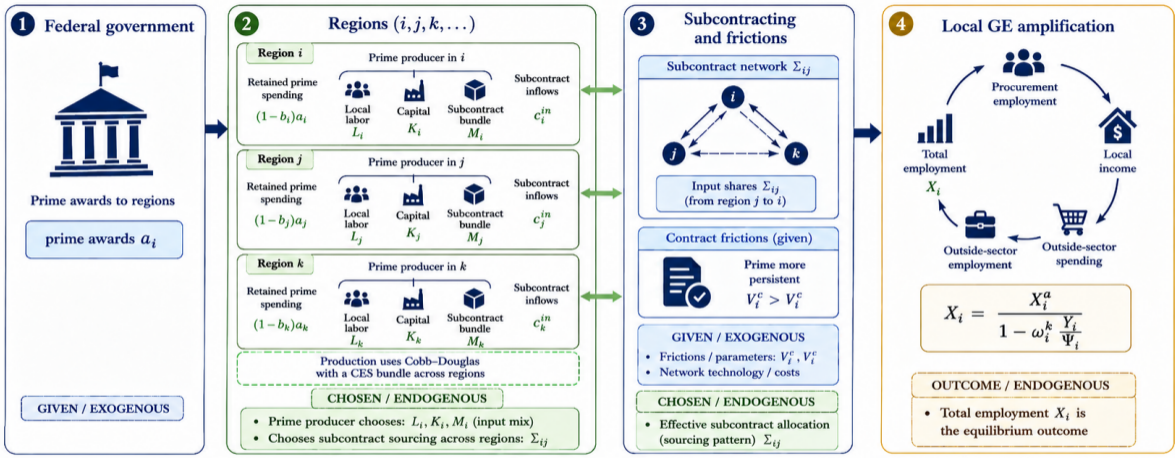
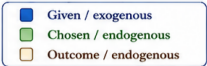
- ▶ Subcontracts flow disproportionately to large goods-producing firms.
- ▶ Small service firms: 47% of prime recipients, 29% of subcontract recipients.
- ▶ Reweighting explains about 30–40% of the employment-response gap.

Persistence

- ▶ Prime relationships are more durable than subcontract relationships.
- ▶ Reported persistence: roughly 0.2 for prime contracting versus 0.1 for subcontracting.
- ▶ Less durable demand induces less hiring for a given dollar.

The paper moves from a reduced-form multiplier fact to a mechanism: **who produces** and **how persistent the relationship is** both matter.

Economic Model



- GIVEN (exogenous)**
- federal awards a_i
 - technologies
 - frictions
 - regional characteristics

- CHOSEN (endogenous)**
- input mix
 - subcontract sourcing
 - labor demand

- OUTCOME (endogenous)**
- regional employment
 - local income
 - total GE effect

Prime effect:

$$S = V_{f,i}^p \cdot \epsilon_{\epsilon,p} + V_{\theta}^c (1-j_e) \epsilon_{\epsilon,q}$$

Subcontract effect:

$$\Theta = V_{f,i}^p \cdot \epsilon_{\epsilon,p} + V_{\theta}^c (1-j_e) \epsilon_{\epsilon,q}$$

★ Typical implication:

$$S > \Theta$$

Notes: a_i = prime awards; b_i = retention rate in region i ; c_i^{in} = subcontract inflows; Σ_{ij} = labor K > subcontract bundle sourced from regions j ; V^e = prime (equity) value; V^c = subcontract (contract) value.

Comment 1: what drives the identification

A shift-share instrument is usually a bundle of many underlying instruments:

$$Z_{it} = \sum_c s_{ic,0} \Delta G_{ct},$$

where c may be a product class, agency, industry, major prime contractor, or agency-by-product cell.

Rotemberg weights ask:

$$\hat{\beta} = \sum_c \hat{\alpha}_c \hat{\beta}_c.$$

- ▶ $\hat{\beta}_c$: the IV estimate using only component c .
- ▶ $\hat{\alpha}_c$: the weight of component c in the full estimate.

The diagnostic tells us whether the estimate is broad-based or instead driven by a small number of high-leverage cells.

Comment 1: robustness should follow the weights

Targeted robustness

- ▶ report systematic leave-one-out estimates excluding the highest-weight product classes, agencies, prime contractors, states, and periods.
- ▶ Test whether the result remains $\hat{\beta}_{retained\ prime} > \hat{\gamma}_{subcontract}$.

Pre-trends and inference

- ▶ Future exposure should not predict pre-period employment, earnings, manufacturing, unemployment, population, or pre-2011 defense exposure.

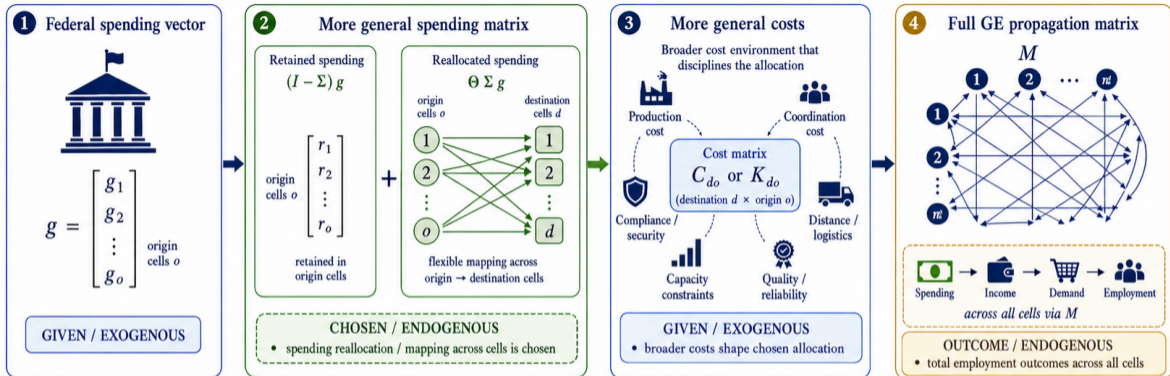
Comment 2: what does a lower employment multiplier mean?

Lower employment per dollar is not necessarily worse procurement.

- ▶ Defense procurement targets mission-relevant goods and services, not local job creation.
- ▶ Subcontracting to large goods-producing firms may reflect scale, certification, security clearance, reliability, quality, or speed.
- ▶ It may also reflect market power, buyer power, hold-up, foreclosure, or weak cost discipline.

The paper estimates **labor-market incidence**. That object is important, but it is not by itself a welfare or procurement-performance ranking.

A More General Model



PZZ local GE becomes a full network-GE mapping

GIVEN (exogenous)

- federal spending vector g
- broad cost matrix C_{do} (or K_{do})
- technology / constraints

CHOSEN (endogenous)

- matrix of spending reallocation Θ
- routing across origin-destination cells

OUTCOME (endogenous)

- employment across all cells n
- network GE propagation via M

Observed network:

$$n^{obs} = M \left[\Lambda^P (I - \Sigma) + \Lambda^S \Theta \Sigma \right] g$$

No-subcontract counterfactual:

$$n^{no\ sub} = M \Lambda^P g$$

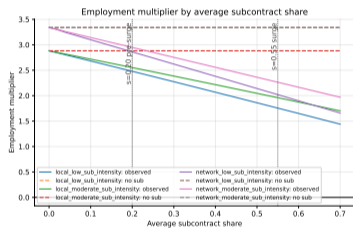
★ What is generalized?

matrix of spending

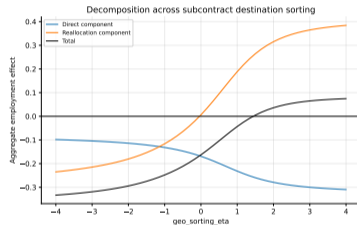
matrix of costs

Comment 3: The more general model suggests robustness of the results

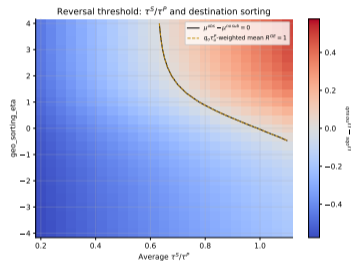
A. Rising subcontract share



B. Direct vs reallocation



C. Reversal threshold



Interpretation. The observed-network multiplier falls as the subcontract share rises when subcontract production is less employment intensive. The decomposition separates the direct intensity gap from geographic reallocation. At the paper-relevant effective-intensity ratios, $\tau^S/\tau^P \approx 0.27-0.41$, reversal requires subcontract dollars to be strongly sorted toward high-intensity destinations.