

# AUSTERITY IN THE SUPPLY CHAIN: HOW MUNICIPAL FISCAL RULES RESHAPE PROCUREMENT AND SUBCONTRACTOR WAGES

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## Where does municipal austerity actually land?

- Municipalities under tighter balanced-budget rules cut capital expenditure, chiefly public works investment, rather than current spending (Grembi, Nannicini and Troiano, 2016; Cerrato, Filippucci and Valle, 2023)
- This adjustment leaves aggregate local labour markets largely unaffected, consistent with low local fiscal multipliers
- Yet municipalities procure public works through contractors and subcontractors, and firms in procurement are known to respond sharply to local fiscal shocks (Coviello, Marino, Nannicini and Persico, 2022)
- No study has traced this shock beyond the contract award, into the firms and workers that execute it. This paper fills that gap



- We exploit the 2012 tightening of the Italian Domestic Stability Pact, which cut transfers sharply for municipalities above 5,000 residents while leaving smaller municipalities exempt



- **First:** *How do treated municipalities adjust the amount, composition and timing of public procurement?*
- **Second:** *Does this adjustment show up in aggregate municipal employment and resident wages?*
- **Third:** *Linking tenders to winning firms and their subcontractors who along the supply chain actually absorbs the shock?*



## RELATED LITERATURE



- Municipalities under tighter balanced-budget rules adjust mainly along the capital-spending margin from the earliest Domestic Stability Pact (Grembi et al. 2016) through later tightenings (Chiades and Mengotto 2013; Cerrato et al. 2023).
- Cerrato et al. (2023) study the 2013 extension of the same rule to municipalities below 5,000 residents: capital spending falls, and the local fiscal multiplier is statistically indistinguishable from zero (Nakamura and Steinsson 2014; Acconcia et al. 2014; Suarez Serrato and Wingender 2016).
- Coviello et al. (2022) trace an earlier tightening of the same threshold (2008) into the procurement sector: exposed firms cut capital rather than labour, in line with evidence that procurement shocks transmit directly to firm-level employment (Ferraz et al. 2015).
- Winning a contract also improves firm survival well beyond its duration, through earnings substitution rather than growth (Cappelletti et al. 2024).



# THE 2012 TIGHTENING OF THE DOMESTIC STABILITY PACT (DSP)



- Since 1999, municipalities above 5,000 residents have faced stricter balanced-budget rules than smaller ones
- In 2012, a national reform (Art. 14, Decree Law 78/2010) cut transfers to these larger municipalities by €2.5 billion a year, smaller municipalities were exempt
- Nothing else changed at the same threshold: the DSP cutoff and mayoral pay rules stayed fixed, so the shock is cleanly isolated
- Treated municipalities absorbed the cut mainly by raising local property taxes, while exempt municipalities faced no such pressure



- Italian public procurement is regulated nationally and supervised by ANAC (*Autorità Nazionale Anticorruzione*)
- During our sample period (2009–2014), the Public Contracts Code (Legislative Decree 163/2006) governed all procedures, mandating competitive tenders for works, services and supplies
- The Code standardised every stage of the process: publication of calls for tender, determination of the base contract value (*importo a base di asta*), evaluation criteria, and transparency requirements
- Municipalities act as contracting authorities for local public works, which is exactly why procurement is so sensitive to fiscal capacity: capital expenditure is the most DSP-constrained component of municipal budgets (Coviello and Gagliarducci, 2017; Cerrato et al. 2023)



# SUBCONTRACTING REGULATION



- Subcontracting was permitted but tightly regulated: the contracting authority had to explicitly authorize it, while the main contractor remained legally responsible for the work.
- A 30% cap on subcontracted contract value was binding for most of the period, especially in construction, where general contractors rely heavily on specialised local subcontractors.
- Every subcontractor and subcontracted amount had to be disclosed, both ex ante and ex post, this obligation is what generates the **openANAC** data used in this paper.
- Though absent from the tendering phase itself, subcontractors are directly exposed to municipal fiscal space and, being smaller and more local, particularly sensitive to procurement contractions (Coviello and Gagliarducci, 2017)



- Two institutional features, taken together, are what make this identification strategy possible.
- **First:** the 2012 reform created a sharp, exogenous contraction in fiscal space only for municipalities just above 5,000 residents, those just below were unaffected.
- **Second:** Italy's procurement regulation, the disclosure obligations tied to subcontracting, makes the complete contracting chain observable through openANAC.
- **These** let us trace not only how municipalities respond to fiscal consolidation, but how that shock propagates to winning firms and subcontractors alike



# DATA: SAMPLE AND SOURCES



- **Procurement data come from openANAC**, covering the universe of contracts awarded by Italian contracting authorities. For each contract, the winning firm, the awarded amount, the contract type, and every disclosed subcontractor.
- **Municipal labour-market outcomes come from INPS administrative archives:** municipality-year employment counts and average annual wages of resident workers.
- **The sample covers Italian municipalities observed between 2009 and 2014**, restricted to a symmetric bandwidth around the 5,000-resident threshold based on legal population in 2012. The census-based value that determines fiscal obligations under the reform.
- **Firm-level outcomes are built by matching procurement records to two separate administrative sources via fiscal codes:** INPS for employee's wages, and Istat's ASIA archive for employment stock



- The unit of observation in openANAC is the **CIG code**, which identifies individual contract lots and allows consistent linking across datasets even when a single tender spans multiple lots.
- **The sample is restricted to contracts above €40,000 awarded by municipal contracting authorities**, with a final status of “awarded” excluding most direct awards and focusing on procedures subject to standard competitive rules.
- **Firms are identified through fiscal codes**: wage outcomes are matched to INPS records, while employment stock for each firm is drawn from Istat's ASIA archive.
- The resulting dataset allows us to analyze the effects of the same fiscal shock on three different outcomes: **municipal procurement volumes, aggregate local labour-market outcomes, and firm-level employment and wages for both winners and subcontractors.**



# DESCRIPTIVE STATISTICS



| Procurement             | Below 5,000 | Above 5,000 |
|-------------------------|-------------|-------------|
| N                       | 7,199       | 4,846       |
| Population (2012, mean) | 4,229       | 5,719       |
| Supply — tender (M€)    | 34.7        | 39.1        |
| Supply — awarded (M€)   | 32.6        | 36.1        |
| Works — tender (M€)     | 393.4       | 418.4       |
| Works — awarded (M€)    | 324.1       | 349.9       |
| Services — tender (M€)  | 180.2       | 220.8       |
| Services — awarded (M€) | 147.5       | 188.1       |
| Total — tender (M€)     | 608.3       | 678.2       |
| Total — awarded (M€)    | 504.1       | 574.0       |

| Local labour market               | Below 5,000 | Above 5,000 |
|-----------------------------------|-------------|-------------|
| N                                 | 2,648       | 1,764       |
| Population (2012, mean)           | 4,244       | 5,725       |
| Weekly wage (€)                   | 459.9       | 460.8       |
| Weekly wage — construction (€)    | 427.8       | 437.2       |
| Weekly wage — elementary occ. (€) | 366.0       | 367.1       |
| Employment (mean)                 | 147.8       | 213.3       |
| Employment — construction         | 13.8        | 20.1        |
| Employment — elementary occ.      | 17.5        | 24.1        |

*Sample means by treatment status (municipalities above vs. below the 5,000-resident threshold). Regional composition is balanced across groups and omitted here for space.*



# DESCRIPTIVE STATISTICS



| Wages                             | Winners<br>Below 5,000 | Winners<br>Above 5,000 | Subcontractors<br>Below 5,000 | Subcontractors<br>Above 5,000 |
|-----------------------------------|------------------------|------------------------|-------------------------------|-------------------------------|
| N                                 | 12,237                 | 9,411                  | 832                           | 516                           |
| Population (2012, mean)           | 4,267                  | 5,753                  | 4,297                         | 5,790                         |
| Average annual wage, deflated (€) | 27,924                 | 28,324                 | 26,953                        | 27,223                        |

| Employment                     | Winners<br>Below 5,000 | Winners<br>Above 5,000 | Subcontractors<br>Below 5,000 | Subcontractors<br>Above 5,000 |
|--------------------------------|------------------------|------------------------|-------------------------------|-------------------------------|
| N                              | 2,523                  | 1,596                  | 158                           | 109                           |
| Population (2012, mean)        | 4,237                  | 5,717                  | 4,415                         | 5,857                         |
| Average annual firm employment | 290.4                  | 340.0                  | 31.8                          | 29.5                          |

*Wages and employment come from separate matched samples (INPS and ASIA respectively), so sample sizes differ across the two panels for the same firm type*



- A **difference-in-discontinuities design** (as in Grembi et al. 2016) exploiting the discontinuity generated by the 2012 DSP reform at the 5,000-resident threshold:

$$y_{it} = \alpha + \beta_1 T_t + \beta_2 D_{it} + \beta_3 P_{it} + \beta_4 (T_t \times D_{it}) + \beta_5 (T_t \times P_{it}) + \beta_6 (D_{it} \times P_{it}) + \beta_7 (T_t \times D_{it} \times P_{it}) + \gamma_i + \delta_t + \varepsilon_{it}$$

- $y_{it}$  = outcome variable of interest for municipality  $i$  in year  $t$  (i.e., log value of procurement, municipal employment, average wages, firm-level employment and wages for winners and subcontractors, depending on the specification)
- $D_{it} = 1$  if municipality  $i$ 's legal population exceeds 5,000 residents, 0 otherwise
- $T_t = 1$  for years after the 2012 reform, 0 otherwise
- $P_{it}$  = legal population, normalised to the 5,000-resident threshold (the running variable)
- $\gamma_i, \delta_t$  = municipality and year fixed effects
- $\beta_4$  = coefficient of interest the causal effect of the DSP tightening
- Standard errors are clustered at the municipality level



# MAIN RESULTS (1): PROCUREMENT



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## No detectable effect on municipal procurement

|                     | Total amount | Supplies | Services | Works   | Days to completion |
|---------------------|--------------|----------|----------|---------|--------------------|
| ATE                 | -0.066       | 0.144    | -0.629   | 0.022   | -0.150             |
|                     | (0.553)      | (0.746)  | (0.298)  | (0.966) | (0.206)            |
| Bandwidth           | 1.815        | 1.907    | 2.002    | 2.081   | 1.904              |
| Observations        | 5,717        | 6,068    | 6,462    | 6,745   | 5,999              |
| Clusters            | 1,244        | 1,322    | 1,411    | 1,475   | 1,318              |
| Adj. R <sup>2</sup> | 0.19         | 0.20     | 0.25     | 0.16    | 0.14               |
| Municipality FE     | YES          | YES      | YES      | YES     | YES                |
| Year FE             | YES          | YES      | YES      | YES     | YES                |

*p-values in parentheses. Standard errors clustered at the municipality level. \*  $p<0.10$ , \*\*  $p<0.05$ , \*\*\*  $p<0.01$ .*

- None of the five coefficients is statistically significant once municipality and year fixed effects are included.
- Point estimates vary in sign and magnitude across outcomes, offering no clear evidence of a procurement-volume response.



Little sign of an aggregate labour-market effect

|                     | Weekly wage<br>(deflated) | Weekly wage<br>— constr. | Weekly wage<br>— elem. occ. | Employment | Employment<br>— constr. | Employment<br>— elem. occ. |
|---------------------|---------------------------|--------------------------|-----------------------------|------------|-------------------------|----------------------------|
| ATE                 | -3.570                    | 7.591                    | 2.811                       | -2.759     | 0.606                   | -1.952*                    |
|                     | (0.508)                   | (0.352)                  | (0.723)                     | (0.353)    | (0.472)                 | (0.089)                    |
| Bandwidth           | 1.340                     | 1.649                    | 1.796                       | 1.910      | 1.989                   | 1.792                      |
| Observations        | 3,949                     | 4,863                    | 5,372                       | 5,765      | 6,091                   | 5,347                      |
| Clusters            | 818                       | 1,009                    | 1,115                       | 1,199      | 1,268                   | 1,109                      |
| Adj. R <sup>2</sup> | 0.74                      | 0.50                     | 0.39                        | 0.97       | 0.83                    | 0.85                       |
| Municipality FE     | YES                       | YES                      | YES                         | YES        | YES                     | YES                        |
| Year FE             | YES                       | YES                      | YES                         | YES        | YES                     | YES                        |

p-values in parentheses. Standard errors clustered at the municipality level. \* p<0.10, \*\* p<0.05, \*\*\* p<0.01.

- Five of six coefficients are not statistically significant. The one exception, employment in elementary occupations (-1.952\*, p = 0.089) is significant only at 10% and calls for a closer look at bandwidth sensitivity



## MAIN RESULTS (3): FIRMS IN THE SUPPLY CHAIN



### Winners seems to be protected; subcontractors are not

|                     | Wages<br>(winners) | Wages<br>(subcontractors) | Employment<br>(winners) | Employment<br>(subcontractors) |
|---------------------|--------------------|---------------------------|-------------------------|--------------------------------|
| ATE                 | -0.005<br>(0.824)  | -0.105*<br>(0.054)        | 0.241<br>(0.166)        | -0.306*<br>(0.069)             |
| Bandwidth           | 7.745              | 7.753                     | 2.141                   | 6.622                          |
| Observations        | 32,096             | 1,014                     | 6,163                   | 968                            |
| Clusters            | 3,984              | 280                       | 1,286                   | 278                            |
| Adj. R <sup>2</sup> | 0.13               | 0.14                      | 0.27                    | 0.19                           |
| Municipality FE     | YES                | YES                       | YES                     | YES                            |
| Year FE             | YES                | YES                       | YES                     | YES                            |

*p-values in parentheses. Standard errors clustered at the municipality level. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .*

- Winning firms show no significant change in wages or employment.
- Subcontractors show a significant decline in both, roughly a 10% wage decline and a 31-log-point fall in employment



# INTERPRETATION



- At the municipal and aggregate labour-market level, the evidence seems to be inconclusive: procurement volumes show no statistically significant change, and only one of six local labour-market outcomes is significant, and only at the 10% level.
- This result is in line with the broader finding of low local fiscal multipliers under capital-based consolidation (Cerrato et al., 2023).
- A sharper pattern emerges once we move to firm-level outcomes: Winning firms show no significant change in employment or wages
- Subcontractors, by contrast, show a significant decline in both wages and employment at the 10% level.
- Our results are consistent with a **distributional channel that operates below the resolution of municipal and aggregate labour-market data**: even without a precisely estimated contraction in procurement itself, its burden, where detectable, falls unevenly across the supply chain rather than uniformly across the local economy.



## CONCLUSION AND POLICY IMPLICATIONS



- Fiscal consolidation does not necessarily dissipate at the municipal level, **it can propagate along the supply chain instead.**
- The incidence of the shock shifts downstream: it lands on **the wages of subcontractors**, not on aggregate local employment or income.
- This has a direct implication for the design of fiscal rules: evaluating their cost through municipal or aggregate labour-market indicators alone **may understate the true incidence of adjustment.**
- That incidence materialises instead at the level of the firms actually executing public contracts, **a channel that current monitoring frameworks do not capture.**



# THANKS FOR YOUR ATTENTION



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