High-Frequency Cross-Sectional Identification of Military News Shocks

Francesco Amodeo[1] **Edoardo Briganti**[2]

[1]UC San Diego

[2]Bank of Canada

September 5, 2025

Bank of Italy

XXIII Public Finance Workshop

The opinions expressed in this presentation are the sole responsibility of the authors and should not be interpreted as reflecting the views of the Bank of Canada.

Outline

Motivation

- Economists are interested in the effects of defense spending because it provides:
  - **Exogenous variation** in government spending (causal inference)
  - (Fiscal) Multipliers of **military build-ups** (policy relevance)

Motivation

- Economists are interested in the effects of defense spending because it provides:
  - **Exogenous variation** in government spending (causal inference)
  - (Fiscal) Multipliers of **military build-ups** (policy relevance)

- Identification challenges:
  - Effects of government spending are anticipated (Ramey, 2011)
  - Measuring expectations is tricky

Motivation

- Economists are interested in the effects of defense spending because it provides:
  - **Exogenous variation** in government spending (causal inference)
  - (Fiscal) Multipliers of **military build-ups** (policy relevance)

- Identification challenges:
  - Effects of government spending are anticipated (Ramey, 2011)
  - Measuring expectations is tricky

→ **Research Question:**

"How can we effectively measure expected defense spending, and what are its economic effects?"

Literature Review

- Macro shocks need to be unanticipated (Ramey, 2016)
  - **Fiscal foresight** Mertens and Ravn (2010),Leeper et al. (2013)
  - **Measurement delays** (Briganti et al., 2025)

  → Non-invertibility of fiscal shocks

Literature Review

- Macro shocks need to be unanticipated (Ramey, 2016)
  - **Fiscal foresight** Mertens and Ravn (2010),Leeper et al. (2013)
  - **Measurement delays** (Briganti et al., 2025)
  - → Non-invertibility of fiscal shocks

→ **Unanticipated measures** of government spending shocks:

- **VAR Restrictions**: Blanchard and Perotti (2002), Ben Zeev and Pappa (2017),(Barsky and Sims, 2011)), Ascari et al. (2023), (Mountford and Uhlig, 2009))
- **Narrative IV**: Ramey and Shapiro (1998), Ramey (2011), Ramey and Zubairy (2018)
- **Bartik IV**: Nakamura and Steinsson (2014), Dupor and Guerrero (2017), Demyanyk et al. (2019), Auerbach et al. (2020), Muratori et al. (2023) , Barattieri et al. (2023), Auerbach et al. (2024)
- **Stock-Price-Based IV**: Fisher and Peters (2010), McClure and Yding (2024)
- **High Frequency IV**: Bandeira et al. (2025) (Brazil Deficit), Wiegand (2025), Gomez-Cram et al. (2025), Hazell and Hobler (2025), Bi et al. (2025)(US Deficits)

Contribution: HFXS Identification

- Novel 2-step method to measure expectations of future military spending
  - I. Identify HF-fiscal events using narrative analysis augmented with LLM searches
  - II. Leverage stock price XS-variation to quantify expected shifts in defense expenditure

Contribution: HFXS Identification

- Novel 2-step method to measure expectations of future military spending
  1. Identify HF-fiscal events using narrative analysis augmented with LLM searches
  2. Leverage stock price XS-variation to quantify expected shifts in defense expenditure
- Advantages:
  1. **Model consistent** methodology grounded in parsimonious asset pricing theory
  2. **Self-validating**: it *estimates* and validates statistically each event (*testing*)
  3. **Generalizable** to contexts with units heterogeneously impacted by aggregate shocks

Contribution: HFXS Identification

- Novel 2-step method to measure expectations of future military spending
  - I. Identify HF-fiscal events using narrative analysis augmented with LLM searches
  - II. Leverage stock price XS-variation to quantify expected shifts in defense expenditure
- Advantages:
  - I. **Model consistent** methodology grounded in parsimonious asset pricing theory
  - II. **Self-validating**: it *estimates* and validates statistically each event (*testing*)
  - III. **Generalizable** to contexts with units heterogeneously impacted by aggregate shocks
- Contributions:
  - I. Novel **LLM-augmented narrative analysis**: key fiscal events
  - II. Novel **military news shocks series** (2001-2023)
  - III. Novel **XS-multiplier estimates** (MSA)

Outline

A Simple Model of Stock Prices

- Gordon (1959):

$$P_{i,t} := \sum_{h=0}^{\infty} \frac{D^e_{i,t+h}}{\prod_{\tau=0}^{h}(1 + i^e_{t,t+\tau})}$$

  - $P_{i,t}$ is the stock price of firm i
  - $i^e_{t,t+\tau}$ is the expected $(t+\tau)$-period interest rate at time t

- Profits $D_{i,t}$ of firm i at time t

$$D_{i,t} := (1 - \tau_t) \cdot \underbrace{(V_{i,t} + G_{i,t})}_{\text{Total Sales}} \cdot \left(1 - \frac{1}{\mu_i}\right)$$

  - $V_{i,t}$ is private sales
  - $G_{i,t}$ is government sales
  - μ_i is the markup; τ_t is a corporate tax

Government Sales: Linked to Stock Prices

- Under (i)–(ii):
  1. Expected profits are proxied by current profits
  2. Expectations hypothesis of the term structure holds

$$P_{i,t} = \frac{D_{i,t}}{1 - \frac{1}{1+i_t}} = \frac{1+i_t}{i_t} \cdot \underbrace{(1-\tau_t) \cdot (V_{i,t} + G_{i,t}) \cdot \left(1 - \frac{1}{\mu_i}\right)}_{D_{i,t}} \tag{1}$$

Government Sales: Linked to Stock Prices

- Under (i)–(ii):

    I. Expected profits are proxied by current profits

    II. Expectations hypothesis of the term structure holds

$$P_{i,t} = \frac{D_{i,t}}{1 - \frac{1}{1+i_t}} = \frac{1+i_t}{i_t} \cdot \underbrace{(1-\tau_t) \cdot (V_{i,t} + G_{i,t}) \cdot \left(1 - \frac{1}{\mu_i}\right)}_{D_{i,t}} \tag{1}$$

$\longrightarrow$ Stock prices are proportional to government sales

Stock Returns Are Proportional to Government Sales

Focus on cross-section (XS) of contractors i

- Denote *Reliance on DoD* by $\lambda_i := \frac{G_i}{G_i + V_i}$; define $G_i := \theta_i \cdot G$
- Log-Differentiate (1) around a **HF fiscal event**:

$$\underbrace{d \log P_i}_{\text{Stock Return}} = \alpha + \underbrace{\lambda_i}_{\text{Reliance}} \cdot \left(\underbrace{d \log G^e}_{\text{Shock}} + d \log \theta_i^e - d \log V_i^e \right) + \varepsilon_i \qquad (2)$$

  - α: time FEs (e.g., $\mathbb{E}$ change in corporate taxes);
  - ε_i: firm-specific FEs (e.g., $\mathbb{E}$ change in markups)

Extract News Shocks from Stock Returns

HFXS Identification: Theorem

Generalization

Under weak Assumptions, regressing stock returns ($d \log P_i$) on reliance on DoD contracts (λ_i)

$$d \log P_i = \alpha + \gamma \cdot \lambda_i + e_i \tag{3}$$

yields

$$\hat{\gamma}_{\text{OLS}} \xrightarrow{p} d \log G^e$$

That is, $\hat{\gamma}_{\text{OLS}}$ consistently estimates expected changes in defense spending ($d \log G^e$)

IDEA: "*If Lockheed Martin's reliance on DoD (λ_i) is 71% and Boeing's is 30%, a positive shock will affect Lockheed's price more, mirroring its larger profit potential.*"

Outline

Introduction

HFXS Framework & Identification

Empirical Results

Application: US GDP XS-Multipliers

Conclusions

Events that Shifted US Expected Military Spending (2000-2023)

Date	*Sign*	*Description of the Event*
11 September 2001	+	9/11 terrorist attacks + ensuing invasion of Afghanistan in October 2001
20 March 2003	+	U.S.-led invasion of Iraq opens a second major war
10 January 2007	+	President Bush's Iraq "Surge" address
4 November 2008	−	Barack Obama elected U.S. president after campaigning to end the Iraq War
2 August 2011	−	Budget Control Act of 2011 signed amid debt-ceiling crisis
1 March 2013	−	U.S. Government Sequestration takes effect after Congress fails to agree on deficit reductions
18 March 2014	+	Russia's illegal annexation of Crimea
22 September 2014	+	Extremist group ISIS seizes large parts of Iraq & Syria
8 November 2016	+	Trump wins 2016 U.S. Elections campaigning on military build-up
9 February 2018	+	Bipartisan Budget Act of 2018 lifts strict BCA spending caps for FY 2018–19
2 August 2019	+	Bipartisan Budget Act of 2019 raises defense spending caps + ends sequestration-era limits
24 February 2022	+	Russia invades Ukraine

Prompt: Narrow Context Without Example

Prompt: Narrow Context With Example

Defense Contractors Data

- Annual official Top100 Report (available from 1958)

$\rightarrow$ 430 Top100 Contractors from FY2001

- **Three conditions**:

Defense Contractors Data

- Annual official Top100 Report (available from 1958)

→ 430 Top100 Contractors from FY2001

- **Three conditions**:

  I. **Public Trading** (NYSE / NASDAQ)

  → 57 contractors

Defense Contractors Data

- Annual official Top100 Report (available from 1958)

$\rightarrow$ 430 Top100 Contractors from FY2001

- **Three conditions**:

  I. **Public Trading** (NYSE / NASDAQ)

  $\rightarrow$ 57 contractors

  II. **Salience**: investors associate contractors to “defense”

  $\rightarrow$ Features $\geq$ 4 times in Top100 report

Defense Contractors Data

- Annual official Top100 Report (available from 1958)

$\rightarrow$ 430 Top100 Contractors from FY2001

- **Three conditions**:

  I. **Public Trading** (NYSE / NASDAQ)
  $\rightarrow$ 57 contractors

  II. **Salience**: investors associate contractors to "defense"
  $\rightarrow$ Features $\geq$ 4 times in Top100 report

  III. **Relevance**: stock price non-negligibly affected by gov. contracts
  $\rightarrow$ (*Reliance*) $\lambda_{i,t} := \dfrac{\text{DoD Contracts}_{i,t}}{\text{Tot. Sales}_{i,t}}; \quad \text{Median}\,(\lambda_{i,t}) \geq 1\%$

Defense Contractors Data

- Annual official Top100 Report (available from 1958)

$\rightarrow$ 430 Top100 Contractors from FY2001

- **Three conditions**:

  I. **Public Trading** (NYSE / NASDAQ)
  $\rightarrow$ 57 contractors

  II. **Salience**: investors associate contractors to "defense"
  $\rightarrow$ Features $\geq$ 4 times in Top100 report

  III. **Relevance**: stock price non-negligibly affected by gov. contracts
  $\rightarrow$ (*Reliance*) $\lambda_{i,t} := \dfrac{\text{DoD Contracts}_{i,t}}{\text{Tot. Sales}_{i,t}}$; $\quad$ Median $(\lambda_{i,t}) \geq 1\%$

$\longrightarrow$ 33 Contractors meet conditions I-III

  – Median reliance 20%. Interquartile range [3.7%, 39.9%]

Top/Bottom Firms | Top 33 = 40% DoD Procurement

Model-Implied XS-Regression

- We have:
  - Set of Narrative Dates $\mathcal{T}$
  - Set of 33 **publicly traded**, **salient** & **relevant** contractors

→ Implement HFXS Regressions

Model-Implied XS-Regression

- We have:
  - Set of Narrative Dates $\mathcal{T}$
  - Set of 33 **publicly traded**, **salient** & **relevant** contractors

→ Implement HFXS Regressions: $\forall \tau \in \mathcal{T}$, estimate emp. analog of Eq. (3):

$$\underbrace{v_{i|t=\tau}}_{\approx d\log P_{i,t}} = \alpha + \underbrace{\gamma_{t=\tau}} \cdot \underbrace{\lambda_{i|t=\tau}}_{\text{Reliance}} + \epsilon_i \qquad \forall \tau \in \mathcal{T},\ \forall i \in \mathcal{I}_\tau \tag{4}$$

- $v_{i|t=\tau}$: weekly excess returns
  - Constructed using Fama-French 3 factors model
  - Frequency: five trading days
- $\lambda_{i|t=\tau}$: reliance on DoD purchases in the quarter of the event

Model-Implied XS-Regression

- We have:
  - Set of Narrative Dates $\mathcal{T}$
  - Set of 33 **publicly traded**, **salient** & **relevant** contractors

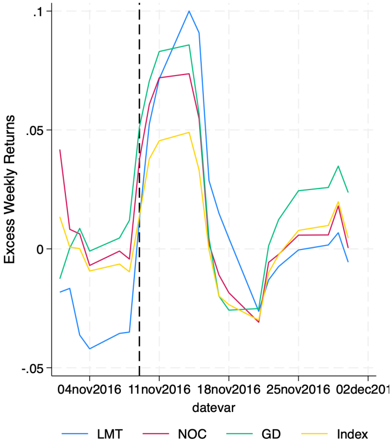
→ Implement HFXS Regressions: $\forall \tau \in \mathcal{T}$, estimate emp. analog of Eq. (3):

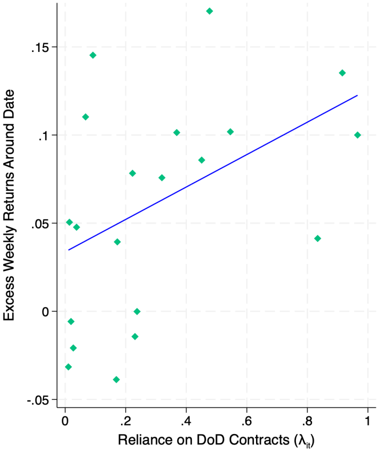
$$\underbrace{v_{i|t=\tau}}_{\approx d \log P_{i,t}} = \alpha + \underbrace{\gamma_{t=\tau}}_{\xrightarrow{\mathbf{p}} \mathbf{d}\log \mathbf{G}^{\mathbf{e}}_{\mathbf{t}}} \cdot \underbrace{\lambda_{i|t=\tau}}_{\text{Reliance}} + \epsilon_i \qquad \forall \tau \in \mathcal{T},\ \forall i \in \mathcal{I}_\tau \tag{4}$$

- $v_{i|t=\tau}$: weekly excess returns
  - Constructed using Fama-French 3 factors model
  - Frequency: five trading days
- $\lambda_{i|t=\tau}$: reliance on DoD purchases in the quarter of the event

⟶ $\gamma_{t=\tau}$: market-implied military news shock

Example: Trump Election (2016Q4)





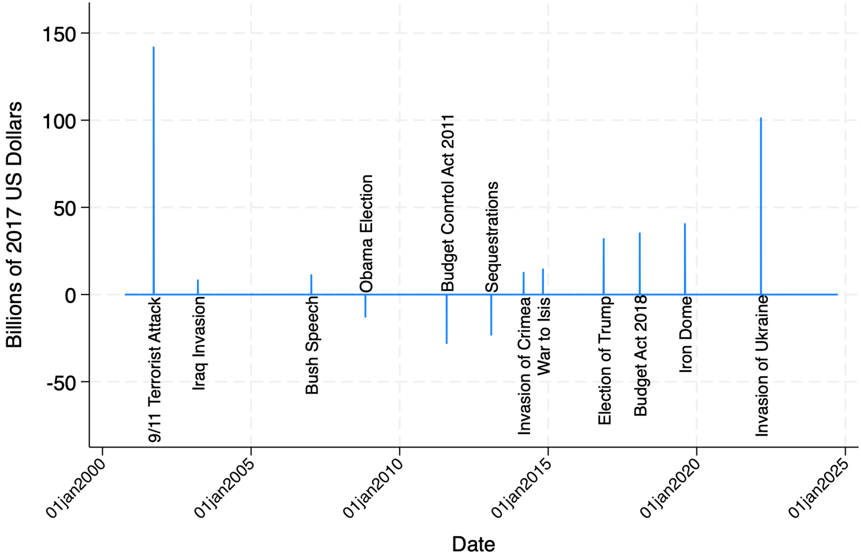
$\rightarrow$ **Estimated Slope** ($\hat{\gamma}$): +0.092 (0.024)

Estimates of HFXS Military News Shocks

Event	*Shock Trading Date*	*Expected Sign*	$\mathbf{d}\log \mathbf{G}_{\mathbf{t}}^{\mathbf{e}}$ $(\gamma_{\mathbf{t}=\tau})$	*pvalue*	*N*	*Defense Index*
9/11 Terrorist Attack	*Sep 21, 2001*	+	0.629 (0.133)	0.000	14	+5.2%
Invasion of Iraq	*Mar 19, 2003*	+	0.029 (0.035)	0.406	20	+ 6.4%
Bush Speech on Iraq	*Jan 11, 2007*	+	0.028 (0.017)	0.117	20	+3.1%
Obama Election	*Nov 6, 2008*	−	-0.031 (0.030)	0.327	18	-2.3%
Budget Control Act 2011	*Aug 2, 2011*	−	-0.065 (0.019)	0.002	23	-3.1%
Sequestrations	*Jan 31, 2013*	−	-0.066 (0.015)	0.000	21	-4.7%
Russia's Invasion of Crimea	*Mar 5, 2014*	+	0.038 (0.021)	0.086	21	+1.5%
War to Isis	*Oct 29, 2014*	+	0.047 (0.024)	0.065	23	+3.3%
Trump Election	*Nov 14, 2016*	+	0.092 (0.043)	0.042	23	+4.9%
Bipartisan Budget Act 2018	*Jan 31, 2018*	+	0.091 (0.038)	0.024	23	+5.8%
Bipartisan Budget Act 2019 + Iron Dome	*Aug 9, 2019*	+	0.101 (0.028)	0.002	23	+3.7%
Invasion of Ukraine	*Mar 1, 2022*	+	0.273 (0.041)	0.000	23	+10.4%

Notes: Robust standard errors in parentheses. Last column (Defense Index), refers to the excess weekly returns of the Defense Index. Interquartile range of excess weekly returns of Defense Index is [-1.0%,+1.0%], 10th and 90th percentiles are -2.2% amd +2.1%.

HFXS Military News Shock Series RZ18 Comparison



Outline

Military News Shocks are (Regionally) Salient!

Pasadena Star-News

News | Local News | Sports | Things to Do | Obituaries | Opinion | The T.E.A.

TRENDING: Stolen bulldog reunited with family | Man accused in kidnapping | Nephew-killer sentenced | Big Bear Lake before/after | Michelin's 'new discoveries'

LOCAL NEWS

Good news about a Trump economy? California's defense industry could benefit

Southern California is expected to benefit from a boost in defense spending under the Trump administration. Monrovia-based AeroVironment Inc. makes a variety of unmanned drones that are used by the U.S. military. One of the company's drones is shown here as a worker prepares to test it in Simi Valley. (Andy Holzman/Los Angeles Daily News)

MOST POPULAR

1. Retired news anchor Chuck Henry's Pasadena home finds a buyer, fast
2. California adopts one of nation's highest fixed-utility fees
3. Alleged motive in Mexico surfer slayings: 'They had a lot of money, devices and the pickup'
4. Chinese food rises to another level at this San Gabriel restaurant
5. An entire California town is for sale — again. This time for $6.6M
6. Kaiser Permanente's inaugural Pasadena medical school cohort set to graduate
7. Here are the ultraprocessed foods you most need to avoid, according to a 30-year study
8. Art Del Rey, an Arcadia pioneer in Spanish language barbershop quartet singing, has died
9. USC faculty censures university president, provost over Gaza protest response
10. USC graduates relieved by smooth sailing on Day One of 100-plus ceremonies

Los Angeles Times

BUSINESS

Southern California aerospace and defense contractors expecting boost from Trump budget

Subscribers are Reading

CALIFORNIA
FOR SUBSCRIBERS
Inside L.A.'s greatest family feud: Warring brothers. A mother's choice. Billions at stake

CALIFORNIA
FOR SUBSCRIBERS
These are the California cities where $150,000 still buys you a home. Could you live here?

HOUSING & HOMELESSNESS
FOR SUBSCRIBERS
Most young adults, renters considering leaving L.A. due to high housing costs, poll finds

LIFESTYLE
FOR SUBSCRIBERS
Walking all 28 miles of L.A.'s longest street in a day tested our limits

CLIMATE & ENVIRONMENT
Regulators approve sweeping change to the way most Californians are billed for electricity

Full Text | Newspaper

THE NATION; Local defense firms expect boost; Trump's budget bodes well for California's aerospace and milit
contractors.

Hennigan, W J. Los Angeles Times; Los Angeles, Calif.. 23 Mar 2017: A.6.

Preview publication details

Los Angel

Full text

Details

Full Text

Southern California's defense industry, long the epicenter for high-flying aerospace technology and advanced weapons for the military, could get a ma
windfall under President Trump's proposed new budget.

LOS ANGELES

Trump Policies Could Be More Benefit Than Burden For California

KCAL NEWS

December 6, 2016 / 9:29 AM PST / KCAL News

LOS ANGELES (CBSLA.com) – The presidential election has thrown California's economic future into turmoil, but maybe for the better, according to the UCLA Anderson Forecast released Tuesday.

President-elect Donald Trump's hardline stance on immigration and trade policy could cost the state any potential federal spending on infrastructure and upgrades. But on the other hand, if he succeeds in increasing spending on defense, California could benefit greatly, according to the report.

Military News Shocks are (Regionally) Salient!

The Atlanta Journal-Constitution

News

Georgia News | Legislature | National & World News | Business | Weekend Things To Do | 2024 Election

NEWS

Trump defense plan ignites hope in Georgia

A photographer takes pictures of Lockheed Martin F-35 Lighting II during a media day of Seoul International Aerospace and Defense Exhibition (ADEX) 2013 in Goyang, South Korea, Monday, Oct. 28, 2013. About 360 defense firms from 28 countries participate in the biennial international aerospace and defense exhibition from Oct. 29 to...

More

By Craig Schneider and Tamar Hallerman

March 7, 2017

tucson.com

Search Arizona Daily Star

E-edition | News | Elections | Obituaries | Opinion | Wildcats | Life & Entertainment | Newsletters | Comics & Puzzles | Wildfires | Jobs | 86° Sunny

WEB ONLY

Raytheon to add nearly 2,000 high-paying jobs in Tucson

David Wichner , Joe Ferguson Nov 18, 2016 Updated May 10, 2018

BUSINESS

Trump looks good for defense business; New faces at the Pentagon; Want to buy an Army Humvee?

BY MARCUS WEISGERBER
GLOBAL BUSINESS EDITOR

NOVEMBER 10, 2016

Last year, Byron Callan was among the first to seriously examine what a President Trump would mean for Wall Street and the investment community.

The Capital Alpha analyst opened his Dec. 13, 2015, note like this: "We don't expect Donald Trump will be the next President. However we have some thoughts regarding defense if we are wrong." The gist: we don't know much about Trump's defense plan other than some broad themes.

A year later, we still don't know the specifics, but it appears that defense spending could be one of this election's biggest winners. Companies had been expecting a boost no matter who won; the question was how much. Now with a Republican heading to the White House in January and the GOP keeping control of both chambers of Congress, the consensus appears "higher than expected," even though Trump has not yet laid out detailed detailed defense plans.

Regional Economic Effects

$$\frac{Y_{\ell,t+h} - Y_{\ell,t-1}}{Y_{\ell,t-1}} = \underbrace{\beta_h}_{\text{XS-Multiplier}} \cdot \frac{G_{\ell,t+h} - G_{\ell,t-1}}{Y_{\ell,t-1}} + \alpha_\ell^h + \lambda_t^h + \varepsilon_{\ell,t+h}$$

- $Y_{\ell,t}$ real GDP, $G_{\ell,t}$ real DoD Contracts, α_ℓ^h & λ_t^h location & time FE; (N = 377; T = 24)

Regional Economic Effects

$$\frac{Y_{\ell,t+h} - Y_{\ell,t-1}}{Y_{\ell,t-1}} = \underbrace{\beta_h}_{\text{XS-Multiplier}} \cdot \frac{G_{\ell,t+h} - G_{\ell,t-1}}{Y_{\ell,t-1}} + \alpha_\ell^h + \lambda_t^h + \varepsilon_{\ell,t+h}$$

- $Y_{\ell,t}$ real GDP, $G_{\ell,t}$ real DoD Contracts, α_ℓ^h & λ_t^h location & time FE; (N = 377; T = 24)

! **Endogeneity**: Reverse Causality (Mintz, 1992), Anticipation (Auerbach et al., 2020)

Regional Economic Effects

$$\frac{Y_{\ell,t+h} - Y_{\ell,t-1}}{Y_{\ell,t-1}} = \underbrace{\beta_h}_{\text{XS-Multiplier}} \cdot \frac{G_{\ell,t+h} - G_{\ell,t-1}}{Y_{\ell,t-1}} + \alpha_\ell^h + \lambda_t^h + \varepsilon_{\ell,t+h}$$

- $Y_{\ell,t}$ real GDP, $G_{\ell,t}$ real DoD Contracts, α_ℓ^h & λ_t^h location & time FE; (N = 377; T = 24)

! **Endogeneity**: Reverse Causality (Mintz, 1992), Anticipation (Auerbach et al., 2020)

→ shift-share (**Bartik**) instrument:

$$Z_{\ell,t+h}^{\text{Bartik}} = \frac{s_\ell \left(G_{t+h} - G_{t-1}\right)}{Y_{\ell,t-1}}$$

- s_ℓ (Share): DoD share of MSA ℓ
- G_t (Shift): National DoD contracts

Regional Economic Effects

$$\frac{Y_{\ell,t+h} - Y_{\ell,t-1}}{Y_{\ell,t-1}} = \underbrace{\beta_h}_{\text{XS-Multiplier}} \cdot \frac{G_{\ell,t+h} - G_{\ell,t-1}}{Y_{\ell,t-1}} + \alpha_\ell^h + \lambda_t^h + \varepsilon_{\ell,t+h}$$

- $Y_{\ell,t}$ real GDP, $G_{\ell,t}$ real DoD Contracts, α_ℓ^h & λ_t^h location & time FE; (N = 377; T = 24)

! **Endogeneity**: Reverse Causality (Mintz, 1992), Anticipation (Auerbach et al., 2020)

→ shift-share (**Bartik**) instrument:

$$Z_{\ell,t+h}^{\text{Bartik}} = \frac{s_\ell \left(G_{t+h} - G_{t-1}\right)}{Y_{\ell,t-1}}$$

- s_ℓ (Share): DoD share of MSA ℓ
- G_t (Shift): National DoD contracts

→ We replace the Shift:

$$Z_{\ell,t+h}^{\text{HFXS}} = \frac{s_\ell \, \mathbb{E}_t(G_{t+1})}{Y_{\ell,t-1}}$$

- $\mathbb{E}_t(G_{t+1})$: HFXS Military News Shocks

2-year XS Multiplier of ≈ 1

Horizon	IV: HFXS Military News Shocks			IV: Standard Bartik		
	Coefficient	*pvalue*	*Effective F*	*Coefficient*	*pvalue*	*Effective F*
Impact	2.647	0.252	1.462	0.095	0.030	17.088
	(2.307)			(0.044)		
Year 1	1.352	0.000	14.939	0.539	0.000	95.193
	(0.369)			(0.125)		
Year 2	0.953	0.000	30.558	0.484	0.001	46.408
	(0.271)			(0.148)		
Year 3	0.614	0.070	6.257	0.639	0.013	15.239
	(0.338)			(0.256)		

Notes: 377 MSAs, 2001-23. GDP price deflator from BEA, base year 2017. Robust SE in parentheses, clustered at MSA level. Montiel Olea and Pflueger (2013) effective F is calculated with `weakivtest`.

→ Military news shocks **have real economic effects**

→ Produce **higher XS-multipliers** than standard Bartik

Robustness: exclusion of 9/11

Outline

Conclusions

- New **model-consistent methodology** to identify military news shocks
  - Estimate & Test shocks from the data!
    - A. Identify narrative events
    - B. Run model-implied HFXS-regressions around events
  - **Self-validating** (sign & significance)
  - **Generalizable** to contexts of aggregate shock/heterogeneous exposure

Conclusions

- New **model-consistent methodology** to identify military news shocks
  - Estimate & Test shocks from the data!
    - A. Identify narrative events
    - B. Run model-implied HFXS-regressions around events
  - **Self-validating** (sign & significance)
  - **Generalizable** to contexts of aggregate shock/heterogeneous exposure
- Application: US Military Spending post-2000:
  - Document **novel series** of key US military events
  - Construct **new** (HFXS) defense news shocks

$\longrightarrow$ Shocks have significant effects on regional GDP (2-year XS-$\mathcal{M} \approx 1$)

Thank You

Outline

Example of Prompt with Non-Controversial Events Back

"Compile a list of dates or events—from 2000 onward—that signal a potential shift in the expected path of US military procurement spending. Include both positive and negative shocks. Examples: (a) September 11, 2001 terrorist attacks: widely seen as a precursor to higher defense spending; (b) Failure in February/March 2013 of President Obama and Congress to reach a budget agreement: triggered automatic cuts (sequestration) and reduced defense spending; (c) Unexpected election victory of Donald Trump, November 2016: he campaigned on increasing military outlays. Use a similar standard to identify and briefly justify each additional event you list."

- 9/11: defense news shock according to Ramey and Zubairy (2018).
- Budget Sequestrations: exogenous fiscal consolidation by Alesina et al. (2014).
- Trump's 2016 election: marginal win + campaign on "*peace through strength*"

Prompt for Narrower Periods without Examples Back

- Context: Iraq & Afghanistan wars followed from 9/11 and prompted increased spending
- Then, we ask:

  "*List the defining moments/events of the war in Iraq and Afghanistan that (a) had large media coverage in the US around the years 2004-2008 and (b) which also gave the impression of an expected increase in military spending in the US.*"

Assumptions for Identification Back

- **Assumption 1.** $\lambda_i \perp d\log V_i^e$
- **Assumption 2.** $\mathbb{E}[d\log V_i^e] = 0$
  Private sales may move in both directions:
  - Lee (2024): new contracts crowd-in private sales via learning-by-doing.
  - Ilzetzki (2023): capacity constraints during WWII may have limited the ability of contractors to expand private
  - di Giovanni et al. (2023): crowding-out on impact, and crowding-in after one year after winning a contract.
- **Assumption 3.** $\lambda_i \perp d\log \pi_i^e := \frac{d\log \mu_i^e}{\mu_i - 1}$
  If investors form expectations about future contractors' profitability, those expectations must be independent of reliance
- **Assumption 4.** $\lambda_i \perp d\log \theta_i^e$
- **Assumption 5.** $\mathbb{E}[d\log \theta_i^e] = 0$
  If investors form expectations about future contractors' profitability, those expectations must be independent of reliance and average out to zero

Framework Generalizable to Broader Macro Contexts

Back

- It is possible to show that:

$$d\log P_{i,t} = \underbrace{\underbrace{\lambda_{i,t}}_{(i)} \cdot \underbrace{\xi_i}_{(ii)}}_{\text{Heterogeneous Exposure}} \cdot \underbrace{d\varepsilon_t}_{(iii)-\text{Shock}}$$

I. $\lambda_{i,t}$: fraction of sales exposed to the news shock

II. ξ_i: elasticity of sales with respect to the shock

III. $d\varepsilon_t$: shock you want to identify

Proposition: Generalization

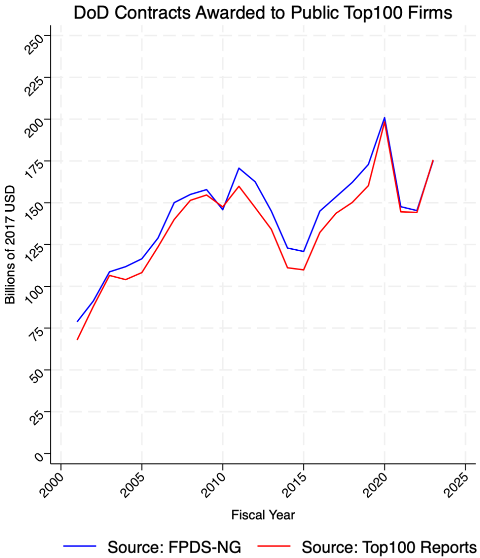
Let units experience a common shock ε_t with heterogeneous loadings captured by observable (or parametrizable) terms $(\lambda_{i,t}, \xi_i)$. Then, estimating the cross-sectional regression around the event yields an estimate of the shock magnitude.

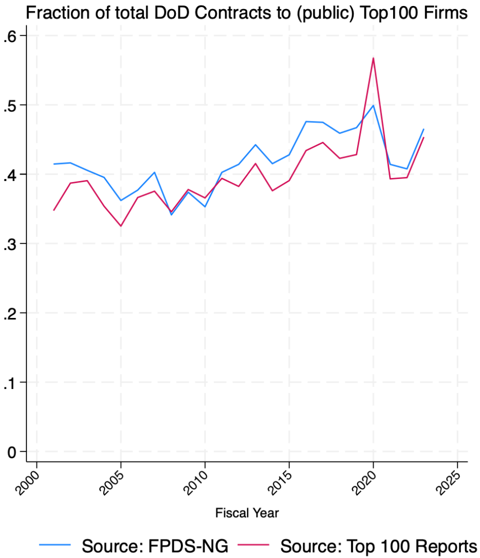
Largest firms in the sample Back

- Median reliance is 20%. Interquartile range is [3.7%,39.9%].
- Top 3 firms by (median) reliance:
  - **VSE Corp** (86%) (Aviation Services)
  - **L3 Harris Technologies** (82%) (Avionics)
  - **Huntington Ingalls Industries** (73%) (Ship building)
- Top 3 firms by fraction of DoD Contracts (FY23):
  - **Lockheed Martin** (14.7%) (Aerospace)
  - **Raytheon (RTX)** (6.5%) (Weapons and Electronics)
  - **General Dynamics** (5.0%) (Aerospace, Submarines, Vehicles)
- Data cross-validation:
  - We match these companies with universe of micro-contracts from FPDS
  - We compare FPDS data with Top100 Report data

  → **The two data sources match!**

33 companies = 40% DoD Procurement spending! Back





Construction of Excess Returns Back

- Need to "*clean*" the returns $\rightarrow$ extract *excess returns*

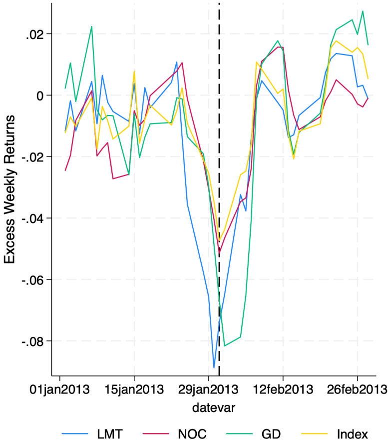
- Fama and French (1993) three factor model:

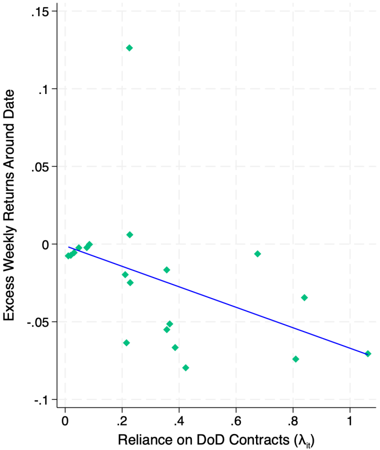
$$r_{i,t} = \alpha_i + \beta_i^1 \cdot \mathrm{MKT}_t + \beta_i^2 \cdot \mathrm{SML}_t + \beta_i^3 \cdot \mathrm{HML}_t + v_{i,t} \quad \forall i \in \mathcal{I}$$

  - $r_{i,t}$: contractors' weekly returns (WRDS)
  - Three factors: MKT (market), SML (size) and HML (value)

$\rightarrow$ $v_{i,t}$: OLS residuals˜ weekly excess returns

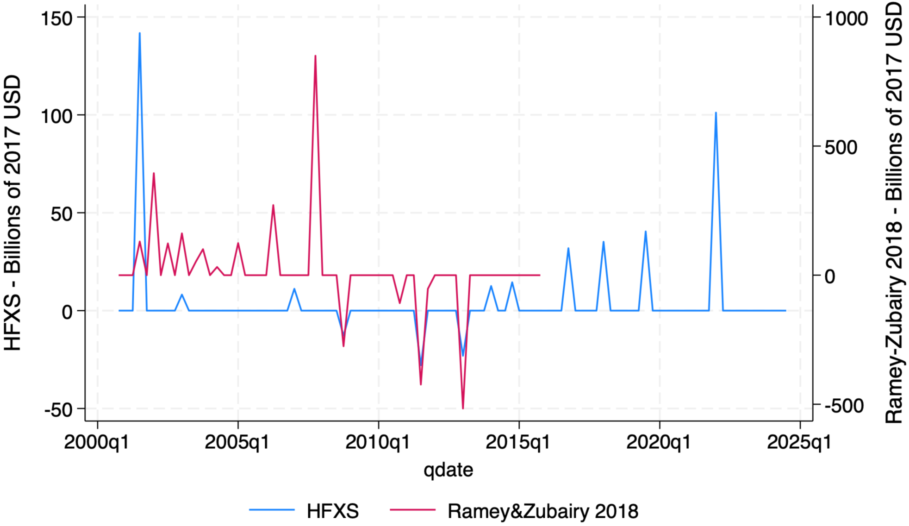
Example 1: Budget Sequestrations (2013Q1) Back





$\rightarrow$ **Estimated Slope** ($\hat{\gamma}$): -0.066 (0.015)

HFXS and RZ18 shocks are similar but not identical Back



Robustness: Exclusion of 9/11 Back

Robustness - Sample: 2002-2023 (Without 9/11) - 377 MSAs								
Horizon	*IV: HFXC Military News Shocks*			*IV: Standard Bartik*			*OLS*	
	Coefficient	*pvalue*	*Effective F*	*Coefficient*	*pvalue*	*Effective F*	*Coefficient*	*pvalue*
Impact	-0.112	0.594	9.428	0.124	0.008	17.575	0.009	0.622
	(0.209)			(0.047)			(0.018)	
Year 1	0.609	0.044	17.868	0.494	0.000	100.184	0.052	0.042
	(0.301)			(0.120)			(0.025)	
Year 2	0.571	0.033	12.293	0.437	0.002	42.991	0.078	0.090
	(0.268)			(0.142)			(0.046)	
Year 3	0.620	0.147	6.656	0.638	0.019	10.163	0.123	0.074
	(0.427)			(0.271)			(0.069)	

Notes: 377 MSAs, 2001-23. GDP price deflator from BEA, base year 2017. Robust standard errors in parentheses, clustered at MSA level. Montiel Olea and Pflueger (2013) effective F is calculated with `weakivtest`, coincides with Kleibergen and Paap (2006) statistic for single instrument