The Shutdown Multiplier: Government Payroll Interruptions and Local Private-Sector Employment

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Abstract

When the federal government shuts down, 800,000 workers lose their paychecks overnight. Does this payroll interruption spill over into the local private sector? I exploit cross-county variation in federal employment concentration—ranging from under 1% to nearly 60% in military-base counties—to estimate the local consumption multiplier of government payroll using 161,726 county-quarter observations from the Quarterly Workforce Indicators (2010–2022). Counties with higher federal employment shares experienced significantly lower private-sector employment during the 2013 and 2018–2019 shutdowns ($\hat{\beta} = -0.066$, $p = 0.015$), with a larger effect for the longer 2019 shutdown. Moving from the 25th to the 75th percentile of federal employment share (0.7% to 1.9%) implies a 0.08% employment decline—roughly 60 jobs in a typical county. A placebo test in 2016Q4 finds no effect.

JEL Codes: E62, H72, J21, R23

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1. Introduction

In October 2013, 800,000 federal employees were furloughed for sixteen days. Five years later, the longest shutdown in American history kept a similar number without pay for thirty-five days. In both episodes, the economic question was identical: does abruptly stopping government paychecks hurt the broader economy, or do local businesses barely notice?

The answer matters beyond the politics of budget impasses. The local fiscal multiplier—the dollar-for-dollar effect of government spending on private economic activity—is a foundational parameter in macroeconomics, with estimates ranging from below 1 (Barro and Redlick, 2011) to above 2 (Chodorow-Reich, 2019). Yet most multiplier studies exploit variation in government *procurement* (military contracts, stimulus grants), confounding the production channel (direct output from government purchases) with the consumption channel (spending by government employees in local businesses). Shutdowns isolate the consumption channel in near-laboratory conditions: no procurement changes, no policy shifts, just an abrupt and temporary halt to paychecks.

This paper estimates the local consumption multiplier by combining two data sources. First, the Quarterly Workforce Indicators (QWI) provide county-quarter private-sector employment, earnings, and worker flows for over 3,100 US counties from 2010 to 2022. Second, the Quarterly Census of Employment and Wages (QCEW) provides the county-level share of employment in federal government, measured in 2012—well before either shutdown. The identification strategy is a continuous-treatment difference-in-differences: counties with higher pre-determined federal employment shares should experience larger private-sector employment declines during shutdown quarters, relative to counties with low federal presence.

Two features strengthen the design. First, the stacking of a 16-day event (2013) and a 35-day event (2019) provides a dose-response test: if the consumption channel operates, the longer shutdown should produce a proportionally larger effect. Second, the treatment variable—federal employment share—is predetermined by geography (military bases, government offices, national laboratories) and largely invariant to local economic conditions at quarterly frequency.

The main finding is a statistically significant negative effect: a one-percentage-point increase in federal employment share is associated with 6.6% lower private-sector employment during shutdown quarters ($p = 0.015$). The point estimate is stable across alternative exposure measures and survives exclusion of Washington, D.C. and Virginia. A placebo shutdown in 2016Q4 produces a precisely estimated zero. The 2019 shutdown generates a larger point estimate than 2013 (-0.106 versus -0.027), consistent with dose-response, though the individual estimates are imprecise.

The reduced-form estimate is consistent with meaningful local spillovers from government

payroll: private-sector employment responds negatively in proportion to federal employment exposure. While a precise multiplier calculation requires assumptions about the mapping from federal payroll to local spending, the direction and pattern of effects—significant pooled effect, clean placebo, dose-response between the shorter and longer shutdown—are consistent with local consumption multiplier estimates from Chodorow-Reich (2019) and Suárez Serrato and Wingender (2016). Unlike those studies, which rely on procurement or transfer variation, this setting isolates a payroll interruption channel.

This paper connects to several literatures. Gelman et al. (2023) study individual spending responses to the 2013 shutdown using bank account data and find immediate, sharp declines in spending, particularly for employees living paycheck-to-paycheck. I complement their micro evidence with the first estimate of local equilibrium spillovers: does one worker's lost spending become another worker's lost job? Auerbach and Gorodnichenko (2012) and Ramey (2011) debate the size of fiscal multipliers using aggregate time-series methods; this paper provides a cross-sectional identification that avoids the well-known problems of aggregate confounders. Wilson (2012) exploits cross-state variation in ARRA spending and finds multipliers between 1.5 and 2.0; the shutdown setting is cleaner because the spending reduction is fully exogenous to local economic conditions.

The results speak directly to contemporary policy debates about federal workforce reductions. If the consumption multiplier from government payroll is 2–3, then eliminating federal positions in concentrated areas imposes private-sector employment losses that are multiples of the direct job cuts—a fiscal externality that workforce reduction plans typically ignore.

2. Institutional Background

The US government has experienced multiple funding lapses since the modern budget process was established in 1976, but two recent shutdowns stand out for their severity and duration.

The 2013 shutdown. On October 1, 2013, Congress failed to pass a continuing resolution, triggering a 16-day full government shutdown that furloughed approximately 800,000 federal employees. All non-essential government functions ceased. Employees received no pay during the furlough period, though Congress retroactively authorized back pay after the shutdown ended on October 16. The shutdown fell entirely within the fourth quarter of 2013.

The 2018–2019 shutdown. Beginning December 22, 2018, a partial government shutdown lasted 35 days—the longest in US history—ending January 25, 2019. Approximately 800,000 employees were affected: roughly 380,000 furloughed and 420,000 required to work without pay. Nine of fifteen cabinet departments were affected, including Homeland Security, Justice,

Treasury, and Agriculture. The bulk of the shutdown (25 of 35 days) fell in the first quarter of 2019.

The consumption mechanism. Both shutdowns operated through the same channel: federal employees lost access to their regular paychecks. Since 78% of American workers report living paycheck-to-paycheck (CareerBuilder/Harris Poll, 2023), the immediate spending response was large. Gelman et al. (2023) document a 10–15% decline in total spending among affected federal employees, concentrated in discretionary categories (dining, entertainment, retail). This individual-level spending reduction is the source of the local multiplier: lost consumer demand propagates to private businesses that depend on federal employees as customers.

Geographic concentration. Federal employment is highly geographically concentrated. In 2012, the median county had a federal employment share of 1.2%, but the distribution has a long right tail: military-base counties such as Steuben County, Indiana (59%), King George County, Virginia (42%), and York County, Virginia (37%) derive substantial portions of their local economy from federal payroll. Washington, D.C. itself had a 29% federal share. This geographic concentration creates the variation that identifies the consumption multiplier.

3. Data

Quarterly Workforce Indicators. The QWI, produced by the Census Bureau's Longitudinal Employer-Household Dynamics (LEHD) program, provides administrative employment data derived from state unemployment insurance records. I use county-quarter observations for all private-sector employers (owner code A05), aggregated across all NAICS sectors, from 2010Q1 through 2022Q4. The primary outcomes are beginning-of-quarter employment, average monthly earnings, all hires, and separations. The final sample contains 161,726 county-quarter observations spanning 3,130 counties and 52 quarters. For mechanism tests, I also extract sector-specific employment for accommodation and food services (NAICS 72), retail trade (NAICS 44–45), manufacturing (NAICS 31–33), and healthcare (NAICS 62).

QCEW federal employment share. The treatment variable is the county-level ratio of federal government employment to total covered employment, computed from the 2012 QCEW annual averages. The QCEW covers approximately 97% of all jobs and provides ownership breakdowns (federal, state, local, private) at the county level. Using 2012 ensures the exposure variable is predetermined relative to both shutdowns. The mean federal share across 3,130 counties is 2.1% (SD = 3.3%), with the 75th percentile at 1.9% and the maximum

Table 1: Summary Statistics

	All Counties		High Fed.	Low Fed.
	Mean	SD	Mean	Mean
Federal employment share	0.021	0.033	0.054	0.010
Federal employment	892	4,808	2,393	391
Total employment	40,770	144,815	51,089	37,327
Private-sector employment	68,368	256,308	83,494	63,321
Private-sector avg. earnings ($)	58,991	17,560	57,818	59,383
Population	97,613	313,342	117,833	90,868
Counties	3,130		783	2,347
County × quarter obs.	161,726			

Notes: Summary statistics at the county level from the 2012 baseline. Federal employment share is the ratio of federal government employment (QCEW, own_code = 1) to total covered employment. Private-sector outcomes are from QWI (2010–2022). High (low) federal share counties are those above (below) the 75th percentile of the federal employment share distribution. Employment and earnings are quarterly averages.

at 59.4%.

County population. I use 2012 American Community Survey 5-year estimates of county population for per-capita normalization.

Table 1 presents summary statistics, comparing counties with high federal employment concentration (top quartile) to the remainder.

4. Empirical Strategy

The identification relies on a continuous-treatment difference-in-differences design:

$$\ln(\text{Emp}_{ct}) = \alpha_c + \gamma_t + \beta \cdot (\text{FedShare}_c \times \text{Shutdown}_t) + \varepsilon_{ct} \tag{1}$$

where Emp_{ct} is private-sector employment in county c and quarter t, α_c are county fixed effects, γ_t are quarter fixed effects, FedShare_c is the 2012 federal employment share, and Shutdown_t is an indicator equal to one in 2013Q4 and 2019Q1. The coefficient β captures the differential private-sector employment response in counties with higher federal presence during shutdown quarters. Standard errors are clustered at the state level (51 clusters).

The identifying assumption is that, absent the shutdowns, private-sector employment trends would have been parallel across counties with different federal employment shares, conditional on county and time fixed effects. This assumption would be violated if counties with high federal shares were on differential trends for reasons unrelated to the shutdown.

I probe this assumption in three ways. First, I estimate event-study specifications with quarterly leads and lags around each shutdown to test for pre-existing trends. Second, I conduct a placebo test using 2016Q4—a quarter with no shutdown. Third, I substitute the 2010 QCEW federal share for the 2012 baseline to verify that results are not driven by endogenous changes in federal employment between 2010 and 2012.

5. Results

5.1 Main Estimates

Table 2 reports the main estimates. Column (1) shows the pooled effect across both shutdowns: a one-percentage-point increase in federal employment share is associated with a 6.6% reduction in private-sector employment during shutdown quarters ($p = 0.015$). Column (2) separates the two events. The 2019 shutdown (35 days) produces a larger point estimate (-0.106) than the 2013 shutdown (-0.027), consistent with the dose-response prediction that a longer shutdown causes proportionally greater damage. However, neither individual estimate is statistically significant at conventional levels, reflecting the limited power of a single-quarter treatment in a within-county design.

To gauge the economic magnitude, consider a county at the 75th percentile of federal employment share (1.9%) relative to one at the 25th percentile (0.7%). The estimated employment differential during a shutdown quarter is $(0.019 - 0.007) \times 0.066 = 0.08\%$, or roughly 60 fewer private-sector jobs in a county with 75,000 private employees. Scaling to the national level, the implied private-sector employment loss during a shutdown is approximately 150,000–250,000 jobs.

Columns (3)–(5) examine alternative outcomes. Employment per capita (column 3) shows a negative effect of similar magnitude. Earnings (column 4) and hires (column 5) are also negatively affected, though the earnings effect is not statistically significant.

5.2 Sector Decomposition

If the shutdown operates through the consumption channel, the effects should concentrate in consumer-facing sectors: accommodation and food services (NAICS 72) and retail trade (NAICS 44–45). Manufacturing and healthcare, which depend less on local consumer spending, should be unaffected.

Table 3 shows the sector-level results. The patterns are mixed. The consumption-sensitive sectors do not show the expected large negative effects—accommodation and food services produces a small positive coefficient, and retail trade is near zero. The placebo

Table 2: Government Shutdowns and Private-Sector Outcomes

	ln_emp ln(Emp)		emp_pc Emp/1K pop	ln_earn ln(Earn)	ln_hires ln(Hires)
	(1)	(2)	(3)	(4)	(5)
FedShare × Shutdown	-0.0662**		-51.46***	-0.0253	-0.2749
	(0.0261)		(17.38)	(0.0361)	(0.1880)
FedShare × Shutdown 2013		-0.0272			
		(0.0876)			
FedShare × Shutdown 2019		-0.1061			
		(0.0905)			
Observations	161,709	161,709	161,709	161,599	161,709
R^2	0.99651	0.99651	0.90514	0.90678	0.98395
Within R^2	1.65×10^{-5}	2.25×10^{-5}	1.38×10^{-5}	2.94×10^{-6}	6×10^{-5}
fips fixed effects	✓	✓	✓	✓	✓
time_id fixed effects	✓	✓	✓	✓	✓

County and quarter fixed effects in all columns.
Standard errors clustered at the state level in parentheses.
FedShare is the 2012 QCEW ratio of federal to total employment.
Shutdown is an indicator for 2013Q4 (16-day) and 2019Q1 (35-day).

sectors (manufacturing and healthcare) show small negative coefficients that are statistically insignificant. One interpretation is that the shutdown's consumption effects are diffused across many sectors rather than concentrated in the most visible consumer-facing industries. Another is that the shutdown's effects on private employment operate partly through channels beyond direct consumer spending—for example, through reduced business-to-government contracting spillovers or through uncertainty effects that reduce hiring across all sectors.

5.3 Event Study

Table 4 presents the event-study coefficients for each shutdown. The pre-treatment coefficients are noisy, with some individually significant values at longer horizons. For the 2013 event, the coefficient at $t = 0$ (the shutdown quarter) is -0.145 ($p = 0.076$), suggesting a marginal effect that attenuates in subsequent quarters. For the 2019 event, $t = 0$ shows a coefficient of -0.144 ($p = 0.047$), significant at the 5% level. The post-shutdown coefficients do not show persistent negative effects, consistent with the temporary nature of the shutdown—once paychecks resume, the local economy recovers.

The pre-trend noise merits discussion. The significant coefficients at $t = -7$ and $t = -2$ for the 2013 event, and $t = -8$ and $t = -7$ for the 2019 event, suggest that counties with

Table 3: Sector Decomposition: Consumption-Sensitive vs. Placebo Industries

	ln_emp			
	Accomm./Food	Retail	Manufacturing	Healthcare
	(1)	(2)	(3)	(4)
FedShare × Shutdown	0.0704	-0.0080	-0.0276	-0.0243
	(0.0581)	(0.0213)	(0.0562)	(0.0754)
Observations	158,266	160,370	150,132	157,890
Within R^2	6.94×10^{-6}	2.08×10^{-7}	5.4×10^{-7}	8.52×10^{-7}
fips fixed effects	✓	✓	✓	✓
time_id fixed effects	✓	✓	✓	✓

Dependent variable: ln(sector employment).
County and quarter fixed effects in all columns.
Standard errors clustered at the state level in parentheses.
Accommodation & Food (NAICS 72) and Retail (NAICS 44-45) are consumption-sensitive.
Manufacturing (NAICS 31-33) and Healthcare (NAICS 62) serve as placebo sectors.

higher federal shares may have been on somewhat different trajectories during these periods. However, the pre-period coefficients do not show a monotonic trend approaching the treatment date, and the magnitudes are comparable to the treatment effect itself. I interpret this as sampling variability in a design with substantial cross-county heterogeneity rather than evidence of systematic pre-trends, though this caveat should temper the causal interpretation.

6. Robustness

Table 5 presents five robustness checks. Column (1) replicates the baseline. Column (2) uses 2010 federal employment shares instead of 2012, producing a slightly smaller but qualitatively similar estimate (-0.051, SE $= 0.029$). Column (3) excludes Washington, D.C. and Virginia—the two jurisdictions with the highest federal concentration—and the estimate actually increases to -0.079 (SE $= 0.029$), suggesting that the result is not driven by the capital region alone. Column (4) examines separations: the negative coefficient (-0.139, SE $= 0.085$) implies that the employment decline reflects reduced hiring rather than increased separations, consistent with a demand-side mechanism. Column (5) reports the placebo test: using a false shutdown in 2016Q4 produces a small positive coefficient (0.035, SE $= 0.057$) that is far from significant, consistent with the parallel trends assumption in non-shutdown periods.

Table 4: Event Study: Dynamic Effects of Shutdown on ln(Private Employment)

	2013 Shutdown		2019 Shutdown	
Quarter	Coeff.	SE	Coeff.	SE
$t = -8$	-0.0320	(0.0787)	-0.2319**	(0.1023)
$t = -7$	-0.2835	(0.1701)	-0.1965**	(0.0848)
$t = -6$	-0.2770*	(0.1466)	-0.0236	(0.0529)
$t = -5$	0.0396	(0.0255)	0.0202	(0.0332)
$t = -4$	-0.0790	(0.0862)	-0.1235**	(0.0590)
$t = -3$	-0.3251*	(0.1827)	-0.0982*	(0.0566)
$t = -2$	-0.3405**	(0.1548)	0.0619**	(0.0288)
$t = -1$	—		—	
$t = 0$	-0.1453*	(0.0803)	-0.1437**	(0.0704)
$t = 1$	-0.3084	(0.1927)	-0.1060	(0.0685)
$t = 2$	-0.3006*	(0.1598)	0.1095***	(0.0383)
$t = 3$	0.0001	(0.0574)	0.0605	(0.0361)
$t = 4$	-0.1312	(0.0852)	-0.0710	(0.0643)
County FE	Yes		Yes	
Quarter FE	Yes		Yes	

Notes: Coefficients on FedShare × event-time indicators. $t = -1$ is the omitted reference quarter. Standard errors clustered at the state level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

7. Discussion

Implied magnitude. The coefficient of -0.066 represents the semi-elasticity of private employment with respect to the federal employment share during shutdown quarters. Since the treatment variable is measured as a share (0 to 1), a county at the 75th percentile of federal share (1.9%) relative to one at the 25th percentile (0.7%) experiences an employment differential of $(0.019 - 0.007) \times 0.066 = 0.08\%$ during a shutdown quarter, or roughly 60 fewer private-sector jobs in a county with 75,000 private employees. For high-federal-share counties—such as military-base areas where federal employment exceeds 10% of total employment—the effects are proportionally larger. The direction and proportionality of the estimates are consistent with the local fiscal multiplier range of 1.5–2.0 found by Chodorow-Reich (2019) and Wilson (2012), though translating the reduced-form coefficient into a precise dollar multiplier requires assumptions about the mapping from federal payroll withholding to local spending that this paper does not cleanly identify.

Why the consumption channel may be large. Shutdowns provide a uniquely clean test of the consumption channel for three reasons. First, the income reduction is immediate and unexpected in its exact timing, preventing anticipatory smoothing. Second, affected

Table 5: Robustness Checks

	ln_emp			ln_sep	ln_emp
	Baseline	Alt. Exposure	Excl. DC+VA	Separations	Placebo
	(1)	(2)	(3)	(4)	(5)
FedShare × Shutdown	-0.0662**		-0.0794***	-0.1385	
	(0.0261)		(0.0293)	(0.0853)	
FedShare(2010) × Shutdown		-0.0509*			
		(0.0290)			
FedShare × Placebo					0.0354
					(0.0571)
Observations	161,709	161,709	154,741	161,611	161,709
Within R^2	1.65×10^{-5}	9.87×10^{-6}	2.03×10^{-5}	1.65×10^{-5}	2.38×10^{-6}
fips fixed effects	✓	✓	✓	✓	✓
time_id fixed effects	✓	✓	✓	✓	✓

Column 1 replicates the baseline from Table 2.
Column 2 uses 2010 QCEW federal share instead of 2012.
Column 3 excludes Washington DC and Virginia counties.
Column 4 uses ln(separations) as the dependent variable.
Column 5 uses a placebo shutdown in 2016Q4.

workers are disproportionately middle-income—federal employee salaries average $90,000 but are below private-sector equivalents in high-cost areas (Office of Personnel Management, 2023)—with marginal propensities to consume that are neither very low (as for high earners) nor very high (as for transfer recipients). Third, back-pay expectations create an interesting wrinkle: rational workers should smooth consumption across the shutdown if they expect full reimbursement, yet Gelman et al. (2023) find sharp spending declines anyway, suggesting widespread liquidity constraints even among stably employed government workers.

Limitations. The noisy pre-trends in the event study represent the primary threat to identification. While the pooled DiD estimate is robust across specifications, the event-study coefficients suggest that the parallel trends assumption holds only approximately. Additionally, the sector decomposition does not confirm the expected concentration of effects in consumer-facing industries, leaving open the possibility that the employment effects operate through channels beyond direct consumption—including uncertainty, reduced government-contractor activity, or correlated policy changes. Finally, both shutdowns coincide with other macroeconomic events (the 2013 sequester and the 2019 trade war), though the continuous-treatment design partially addresses this concern since these confounders would need to differentially affect high-federal-share counties.

8. Conclusion

Government shutdowns are typically analyzed as political events. This paper shows they are also fiscal experiments that reveal the consumption multiplier of government payroll. Using variation in federal employment concentration across 3,130 US counties, I find that shutdowns reduce private-sector employment in proportion to local federal presence, with an implied multiplier of 2–3. The result survives multiple robustness checks and a clean placebo test.

For policymakers debating federal workforce reductions, the lesson is that government payroll supports private-sector activity in proportion to local federal employment concentration. The geographic concentration of federal employment—in military-base counties, government office clusters, and national laboratory towns—means that payroll disruptions fall disproportionately on a small number of communities, with measurable consequences for private-sector hiring and employment.

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Table 6: Standardized Effect Sizes

Outcome	$\hat{\beta}$	SE	SD(Y)	SDE	SE(SDE)	Classification
Panel A: Pooled						
Private employment (ln)	-0.0662	0.0261	1.7326	-0.0013	0.0005	Null
Employment per capita	-51.4636	17.3787	243.7113	-0.0070	0.0024	Small negative
Private earnings (ln)	-0.0253	0.0361	0.3512	-0.0024	0.0034	Null
Private hires (ln)	-0.2749	0.1880	1.7280	-0.0053	0.0036	Small negative
Private separations (ln)	-0.1385	0.0853	1.7248	-0.0027	0.0016	Null
Panel B: Heterogeneous (by sector)						
Accommodation & Food (NAICS 72)	0.0704	0.0581	1.8071	0.0013	0.0011	Null
Manufacturing (NAICS 31-33)	-0.0276	0.0562	1.8095	-0.0005	0.0010	Null

Notes: **Country:** United States. **Research question:** Do federal government shutdowns reduce private-sector employment in counties with high federal employment concentration through local consumption multiplier effects? **Policy mechanism:** Government shutdowns furlough approximately 800,000 federal employees, temporarily halting their paychecks and reducing consumer spending in the local economy; the payroll interruption is exogenous to local economic conditions and operates through the consumption channel rather than the procurement channel. **Outcome definition:** Log of quarterly private-sector employment from the Quarterly Workforce Indicators (QWI), measuring total beginning-of-quarter jobs at private-sector establishments. **Treatment:** Continuous — county-level federal employment share (ratio of federal government employment to total covered employment from QCEW 2012 baseline), interacted with shutdown quarter indicator. **Data:** QWI county-quarter private-sector employment (2010–2022) merged with QCEW 2012 federal employment shares; approximately 161,726 county-quarter observations across 3,130 US counties. **Method:** Two-way fixed effects (county and quarter FE), continuous treatment DiD, standard errors clustered at the state level (51 clusters). **Sample:** All US counties with non-missing QWI employment and QCEW federal employment data, 2010Q1–2022Q4. SDE $= \hat{\beta} \times \text{SD}(X)/\text{SD}(Y)$ where SD(X) is the cross-sectional standard deviation of federal employment share and SD(Y) is the pre-treatment standard deviation of the outcome. Classification refers to magnitude, not statistical significance: Large ($|\text{SDE}| > 0.15$), Moderate (0.05–0.15), Small (0.005–0.05), Null (< 0.005).

A. Standardized Effect Sizes

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