

Job Dynamics with Staffed Labor

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NBER Wage Dynamics in the XXI century
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Remark (Census Bureau)

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Job reallocation as the engine of productivity growth

- Secular decline in job reallocation rate since the early 1980s Davis et al., 2007; Davis, Faberman and Haltiwanger, 2012; Hyatt and Spletzer, 2013; Decker et al., 2014; Haltiwanger, Hathaway and Miranda, 2014; Decker et al., 2016
- Potentially increases *misallocation* and hinders *productivity* Hopenhayn and Rogerson, 1993; Foster, Haltiwanger and Krizan, 2001
- Productivity effects depend on reason behind drop, and what new processes are in place for firms to adjust labor (if any)

[More literature](#)

This paper

- ★ We document a significant *shift* from payroll employees to staffing
- ★ We estimate how staffing affects aggregate labor reallocation
- ★ We explore the business-level rationale and dynamics of staffing

This paper

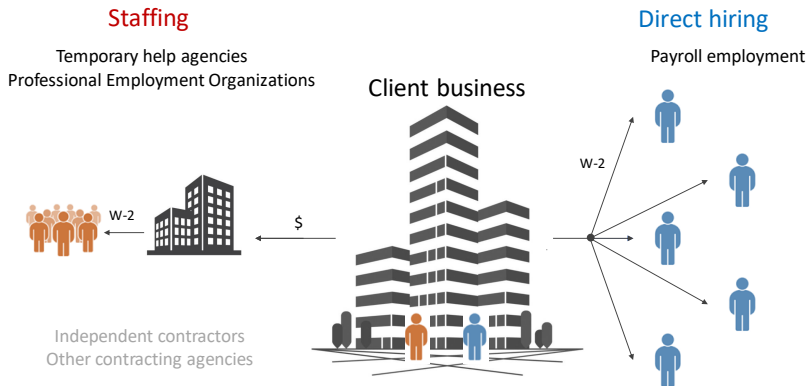
- ★ Significant **shift from payroll employees to staffing** since 2006
 - ◇ 4 in 10 manufactures have positive yearly expenditure on staffing
 - ◇ Increased by 85% as a share of the avg manufacture's revenue
- ★ How staffing affects aggregate labor reallocation
 - ◇ Staffing surge equivalent to **37% of the measured decline** in the aggregate job reallocation rate
- ★ Business-level dynamics of staffing
 - ◇ Staffed labor is **more responsive to shocks** than payroll labor

Today's presentation

- I. Measurement and data
- II. Payroll reallocations, staffed reallocations
- III. Staffing as a flexible margin of adjustment

Measurement and data

Staffing: unmeasured job flows



- Staffing breaks the equivalence between jobs and employers
- Staffed workers do **not** change their employer *of record* as they change jobs

Gross Job Reallocations

Sum of **plant-level job gains and losses** that occur between $t - 1$ and t :

$$JR_t = \sum_j |emp_{jt} - emp_{jt-1}| = \underbrace{\sum_{J^+} (emp_{jt} - emp_{jt-1})}_{JC_t} + \underbrace{\sum_{J^-} |emp_{jt} - emp_{jt-1}|}_{JD_t}$$

$$JR_t = \sum_j \left| \underbrace{(emp_{jt}^p + emp_{jt}^s)}_{\text{total labor at } t} - \underbrace{(emp_{jt-1}^p + emp_{jt-1}^s)}_{\text{total labor at } t-1} \right|$$

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Traditional measure

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What we add

Flows Mismeasurement and Data to Remedy

Staffing leads to undercounting job flows: jobs are created and destroyed, but unless there is a change in the staffing agency's payroll employment, flows are not registered. Example

ESTABLISHMENT-LEVEL DATA (ASM, CM; LBD)

1. Expenses on temporary staff and leased employees (2006-2017), payroll, payroll employment
2. Location, age, payroll employment

FIRM-LEVEL DATA (RE-LBD)

3. Payroll/revenue for plants in Employment Services (NAICS 5613)

Staffing: definition in ASM

- **Expenditures on temporary staff and leased employees** are a subset of operating expenses (ASM form – item 16C)

Temporary staff and leased employee expense - Total costs paid to Professional Employer Organizations (PEOs) and staffing agencies for personnel. (Include all charges for payroll, benefits and services.) (Report in thousands of dollars)

Prior year temporary staff and leased employee expense - Total costs paid to Professional Employer Organizations (PEOs) and staffing agencies for personnel. (Include all charges for payroll, benefits and services.) (Report in thousands of dollars)

- Organization/agency must be in NAICS 561320 or 562330.
- Narrow definition is adopted on purpose: these types of staffed workers typically work side-by-side payroll employees and are in production occupations. **Outsourcing, instead**

Staffing in U.S. manufacturing

Secular rise and cross-sectional prevalence over sectors, age, size, and revenue growth

1. The employment share of temporary help firms has grown by over 80% since the 1990s
2. Most staffed workers ($\simeq 30\text{-}35\%$) are assigned to manufacturing plants
3. About 8 in 10 establishments report expenditures for staffed labor *at least once* in their life cycle
4. About 4 in 10 report positive expenditures on staffed workers *for every year* between 2006-2017
5. The average manufacturer increased its staffed labor share of revenue by 85% in 2006-2017 (with little role for composition in the aggregate)
6. Larger, older, and hi-tech establishments are more likely to use staffing arrangements
7. However, the share of revenue spent on staffed labor is higher in smaller and younger establishments
8. The use of staffing is increasing in revenue growth
9. The share of revenue spent on staffed labor is U-shaped in revenue growth

Graph 1

Table 2

Graph 5

OP decomp

Table 6

Table 7

3-digit NAICS for 7

Graph 8

Graph 9

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Staffing and aggregate job flows

Gross job reallocation

- Sum of **plant-level employment gains and losses** between $t - 1$ and t :

$$\begin{aligned}JR_t &= \sum_{j \in \mathcal{J}_{t-1,t}} |\text{emp}_{jt} - \text{emp}_{jt-1}| \\ &= \sum_{j \in \mathcal{J}_{t-1,t}^+} (\text{emp}_{jt} - \text{emp}_{jt-1}) + \sum_{j \in \mathcal{J}_{t-1,t}^-} |\text{emp}_{jt} - \text{emp}_{jt-1}| \\ &\equiv \text{Job Creation}_t + \text{Job Destruction}_t\end{aligned}$$

- We define *employment* to include **both** payroll and staffed employees:

$$\text{emp}_{jt} = \text{emp}_{jt}^P + \text{emp}_{jt}^S$$

- Traditionally, reallocation calculated only with emp_{jt}^P
- We also define *staffed* job reallocation using only emp_{jt}^S

Imputation of staffed head count from staffing expenses

Goal: computing staffed employment flows

$$\text{exp}_{jt}^S = \text{emp}_{jt}^S w_{jt}^S (1 + \alpha)$$

$$\widehat{\text{emp}}_{jt}^S = \frac{1}{1 + \hat{\alpha}} \frac{\text{exp}_{jt}^S}{\hat{w}_{jt}^S}$$

- Need to make assumptions on (average) wages of staffed workers and agencies' profit rates
- We will make conservative assumptions so that our results on aggregate outcomes are lower bounds [Details](#)
 - ▶ overestimate staffed wages
 - ▶ overestimate agency markups

Staffed job flows: a large and increasing share of aggregate job flows

	Staffed Job Creation SJC	Staffed Job Destruction SJD	Staffed Job Reallocations SJR
<i>Yearly staffed job flow</i>			
Average	16.20	13.66	14.61
Std. Dev.	2.47	3.68	2.66
2017 - 2007	4.19	8.57	6.48

Note: annual staffed job flows are reported relative to payroll job flows.

1. On average (2007–2017), **staffed** job flows are **about 15%** of payroll job flows.
2. Staffed job reallocation rates are **increasing** over time

Staffed jobs reallocate at a higher pace compared to payroll jobs

	JC	JD	JR
<i>Yearly job flow rate</i>			
Payroll			
Average	7.52	7.98	15.49
Std. Dev.	1.29	2.86	2.07
2017 - 2007	12.31	-12.35	-0.46
Staffed			
Average	30.38	25.99	56.36
Std. Dev.	6.12	6.70	10.01
2017 - 2007	-1.42	6.21	1.90
<i>Job flow percentage change (2017 - 2007)</i>			
Payroll	-2.14	-23.62	-13.27
Staffed	22.99	32.50	27.12
Total	1.39	-17.76	-8.33

SJR surge equivalent to **37%** of secular decline in reallocation rate

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SJC and SJD

Net SJC by growth decile

Tenure of staffed workers

Staffing is more responsive to revenue shocks than payroll labor

Details

$$\Delta_{\tau} \exp_j^{\ell^c} = \beta_0 \cdot \Delta \text{rev}_{jt} + \mathbf{X}'_{jt} \gamma + \varepsilon_{jt} \quad \text{for } c \in \{P, S\}$$

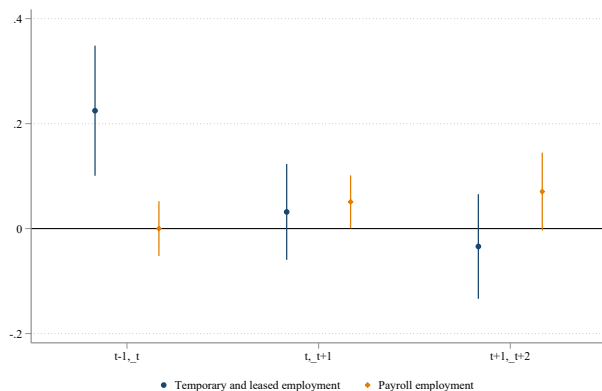
Dependent variable	OLS	IV – Import price	IV – Exchange rate
Payroll			
$t - 1, t$	0.3327 (0.0061)	0.4603 (0.1073)	0.4174 (0.1575)
$t, t + 1$	0.0375 (0.0047)	0.4002 (0.1447)	0.5858 (0.2132)
$t + 1, t + 2$	-0.0001 (0.0043)	-0.0959 (0.1236)	-0.8149 (0.2608)
Staffing			
$t - 1, t$	0.6708 (0.0170)	2.092 (0.580)	5.053 (1.247)
$t, t + 1$	-0.1403 (0.0150)	0.0624 (0.5116)	0.7697 (0.7881)
$t + 1, t + 2$	-0.0874 (0.0155)	-0.2383 (0.5665)	-2.691 (0.9977)
First-stage F-statistic	–	41.27	19.27
OBSERVATIONS	115,000	115,000	101,000

Size, age, year, industry, and state fixed effects utilized throughout. Standard errors clustered at the establishment level and denoted in parentheses.

Staffing is more responsive to productivity shocks than payroll labor

Details

$$\Delta_{\tau} \text{emp}_j^{\ell^c} = \beta_1 \cdot \Delta_{\tau} \ln(\text{TFPR}_j) + \mathbf{X}'_{jt} \gamma + \varepsilon_{j\tau} \text{ for } c \in \{P, S\}$$



Controls include change in productivity interacted with linear trend, third-degree polynomial of productivity change, initial employment size, initial employment size interacted with linear trend, plant age, industry-year and state FE, and cyclical indicators. Staffed employment change is set to 0 if plant j does not use staffing in neither period of interest, and equal to the DHS growth rate otherwise.

Extensions

Data:

- Elasticity of substitution between payroll and staffed labor from data
- Account for differential wage growth trends with OEWS data
- “Expenditure reallocation” rates

Quantitative:

- Estimate productivity effects of shift to staffing, using a model with adjustment costs (Hopenhayn, Rogerson 1993)

Staffing

- Staffing employment is a growing part of labor for U.S. manufactures.
 - ◇ This increase is across-the-board, more salient for smaller, younger, high-growth plants, and consistent with a drop in short-duration jobs.
- Staffing leads to mismeasurement of aggregate labor market flows.
 - ◇ Surge in staffed reallocations equivalent to 37% of drop in job reallocation since 2006.
- Staffing is a flexible margin of adjustment.
 - ◇ Staffed employment is considerably more responsive than payroll employment.

Appendix

Contribution to the literature

1. Staffing (or outsourcing) in macro

Houseman (2001); Erickcek, Houseman, and Kalleberg (2003); Dey, Houseman, and Polivka (2010); Autor and Houseman (2010); Ono and Sullivan (2013); Houseman and Heinrich (2015); Bernhardt and Houseman (2017); Goldschmidt and Schmieder (2017); Bilal and Lhuillier (2021); Bergeaud et al. (2021); Estefan et al. (2024)

- Cross-sectional and time series evidence from U.S. Census data
- Evidence on the flexibility advantages of staffing

2. Labor market dynamism Facts

Davis, Haltiwanger, and Schuh (1996); Davis, Faberman, and Haltiwanger (2006); Davis and Haltiwanger (2014); Decker et al. (2014, 2016, 2020)

- Effect of staffing on measurement and interpretation of job creation, destruction, and reallocation

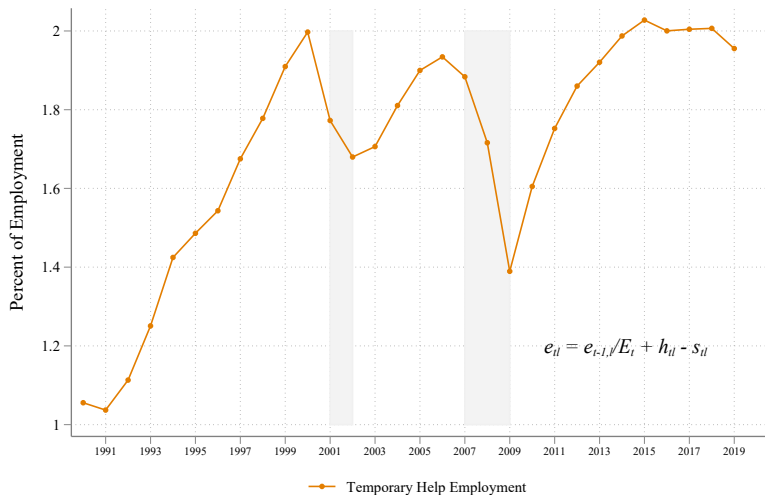
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Staffing: trade-offs

- **Staffing** is an intermediate technology to source labor.
- Businesses can source labor either through **direct hiring** (payroll) or via **staffing** agencies (outsourcing).
- Advantages of staffing:
 1. Avoid labor adjustment costs
 2. Reach optimal scale faster
- Costs of staffing:
 1. Fixed cost: establish a relationship with a staffing agency
 2. Variable costs: wage markups of staffing agency
 3. Possibility of hiring less productive workers

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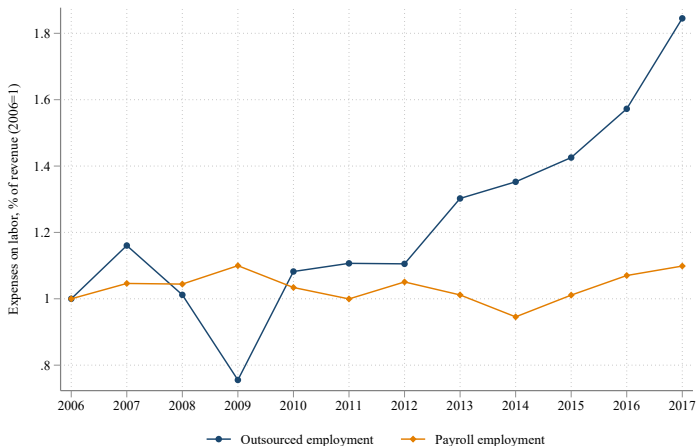
Labor share of staffing firms grew over 80% since 1990



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Growth of staffed labor vs. payroll labor (2006–17)

- Revenue share of staffed labor for average plant has increased by more than 80% over 2006–2017.
- Payroll labor does not show this trend.



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Industry composition of temporary help workers

	1995	1997	1999	2001	2005	2017
Agriculture, forestry, fishing	0.30	0.00	0.40	0.90	0.80	0.80
Mining	0.20	0.70	0.10	0.90	0.50	0.70
Construction	2.90	2.60	2.70	3.50	3.50	3.40
Manufacturing	34.10	32.10	31.20	22.70	29.50	34.90
Wholesale trade	2.90	4.40	4.10	3.10	5.70	4.00
Retail trade	5.30	3.30	4.10	4.10	3.30	2.90
Transportation	7.40	6.40	6.30	8.00	3.80	5.30
FIRE	6.90	8.40	7.10	7.00	3.80	4.30
Business & repair	22.60	25.90	25.60	30.30	29.20	23.20
Personal services	2.70	1.90	3.40	1.00	3.30	0.90
Entertainment & recreation	0.70	0.90	0.50	1.90	0.00	0.60
Professional services	12.60	13.20	13.20	14.10	13.80	18.10
Public administration	1.30	0.00	1.20	2.40	2.90	1.00

Source: CPS Contingent Worker Supplement (1990 census industrial classification system)

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Hopenhayn and Rogerson (1993)

- A tax τ on firing employees equal to 1 year's of wages is associated with a $(30 - 22 =)$ 8% decline in job turnover rates.
 1. Reduction of aggregate productivity by 2.1%
 2. Reduction of aggregate employment by 2.5%
 3. Reduction of welfare (utility-adjusted consumption) by 2.8%
- Adjustment cost function: $g(n_{t-1}, n_t) = \tau \cdot \max\{0, n_{t-1} - n_t\}$
- Changes are relative to a frictionless economy.

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Staffing: definition in ASM

- Our definition, purposefully, does **not** include staffed services such as:
 - ◇ Purchased professional and technical services (including management consulting, accounting, auditing, bookkeeping, legal, actuarial, payroll processing, architectural, engineering and other professional services)
 - ◇ Other services including data processing and other purchased computer services, purchased communication services, and purchased advertising and promotional services are included in different items.
- This is to ensure that staffing employment is related to the core of a plant's business.
- Contract work is counted towards material inputs.

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Age, size, tech status and growth

	Share of clients	Share of revenue
Whole sample	47.14	1.70
<i>Establishment age</i>		
0-4	41.51	2.23
5-9	44.29	1.81
10-29	47.63	1.60
30+	51.97	1.45
<i>Establishment size</i>		
1-9	27.60	2.54
10-49	39.88	1.99
50-249	67.51	1.31
250+	81.19	1.01
<i>High-tech status</i>		
High-tech	63.62	1.46
Low-tech	46.11	1.72

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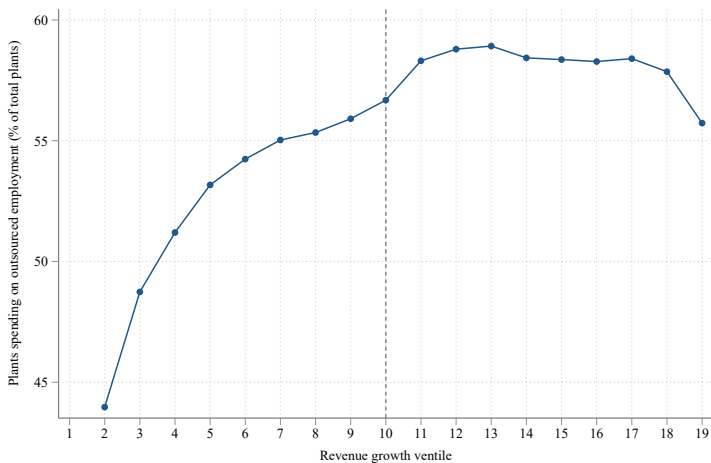
Intensive and extensive margin by 3-digit NAICS

	Establishments (%)	Temp and leased staff revenue share (clients)
Food Manufacturing	47.33	1.81
Beverage and Tobacco Product	48.06	1.92
Textile Mills	51.03	1.60
Textile Product Mills	34.37	1.73
Apparel	26.98	1.81
Leather and Allied Product	33.03	1.27
Wood Product	37.17	2.11
Paper	70.78	1.14
Printing	44.14	1.93
Petroleum and Coal Products	25.36	1.27
Chemical	59.63	1.32
Plastics and Rubber Products	67.48	2.07
Nonmetallic Mineral Product	26.29	1.52
Primary Metal	59.24	1.05
Fabricated Metal Product	47.22	1.81
Machinery	52.69	1.46
Computer and Electronic Product	61.83	1.58
Electrical Equipment, Appliance, and Component	62.44	1.44
Transportation Equipment	60.64	1.55
Furniture and Related Product	40.35	1.86
Miscellaneous	41.17	1.97

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Revenue growth (1)

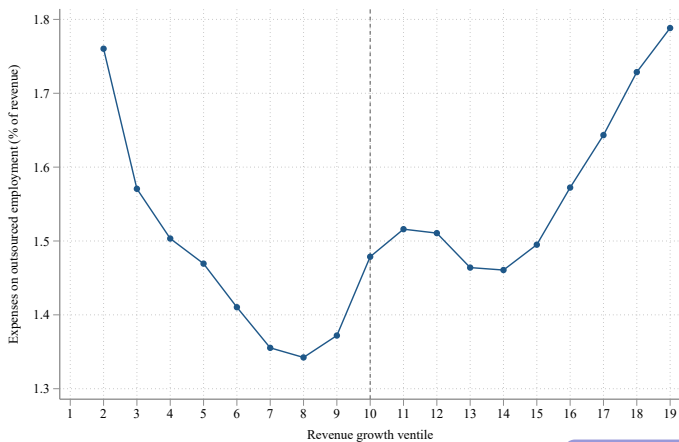
- The **use of staffing** is **increasing in revenue growth**.



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Revenue growth (2)

- The **share of revenue** spent on staffed labor is **U-shaped in revenue growth**.

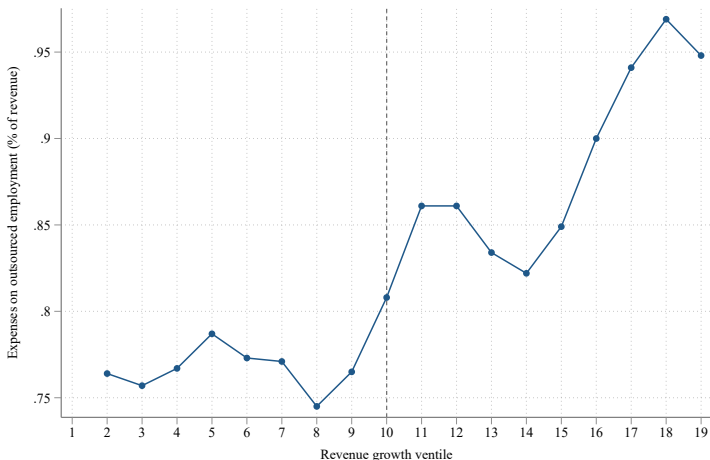


Non-clients included

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Revenue growth (3)

- Temporary and leased staff use intensity varies along revenue growth



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Rise in staffing: no role for composition

- Aggregate revenue share of staffing is a revenue-weighted average of staffing shares: OP decomposition

$$\sigma_t^{\text{staffing}} = \sum_{j \in \mathbf{J}_t} \omega_{jt} \cdot \varsigma_{jt}^{\text{staffing}} = \underbrace{\frac{1}{|\mathbf{J}_t|} \sum_{j \in \mathbf{J}_t} \varsigma_{jt}^{\text{staffing}}}_{\text{OP-MEAN}} + \underbrace{\text{COV}(\omega_{jt}, \varsigma_{jt}^{\text{staffing}})}_{\text{OP-COV}}$$

- No role for composition within- or across industries:
 - Rise in staffing is due to OP-MEAN component.
 - Holding industry shares fixed leads to almost identical rise in staffing.

Details

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Composition

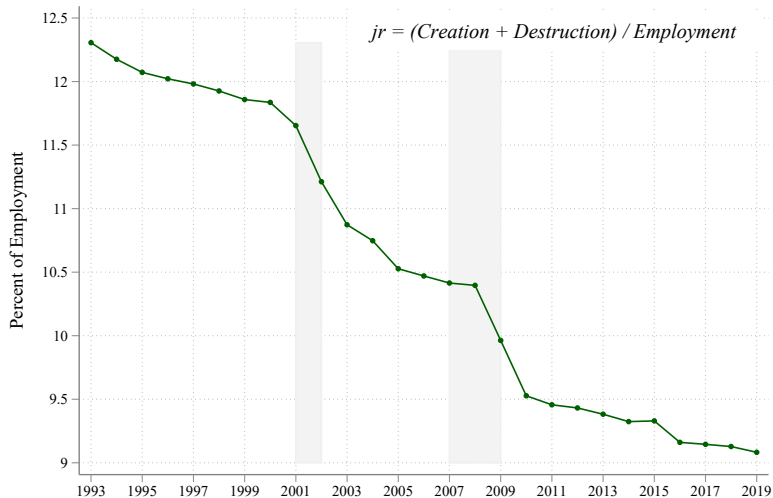
- OP decomposition: OP-MEAN drives rise in staffing.
- Holding industry shares fixed at 2007 levels: nearly identical rise in staffing

Year	Data	OLLEY-PAKES DECOMPOSITION		FIXED INDUSTRY SHARES
		OP-MEAN	OP-COV	Counterfactual
2007	0.4850	0.7936	-0.3085	0.4850
2012	0.5172	0.8993	-0.382	0.5189
2017	0.6176	0.9962	-0.3786	0.6023

Note: values are denoted in percentages.

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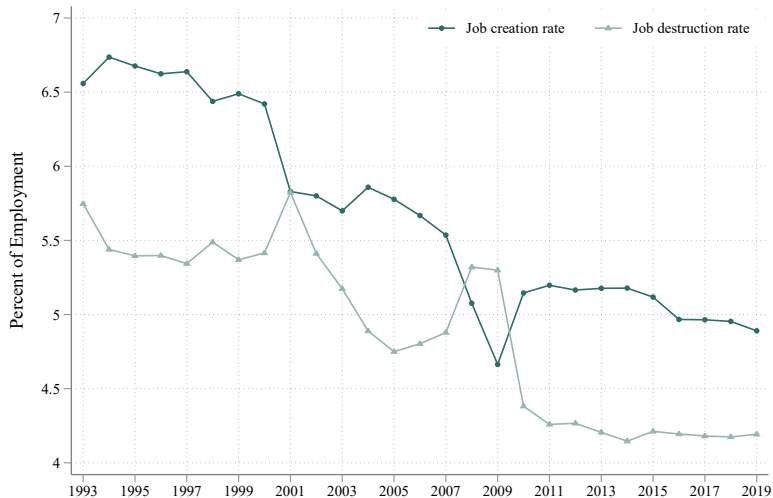
Aggregate payroll job reallocation rate



Source: Quarterly Workforce Indicators, U.S. Census Bureau

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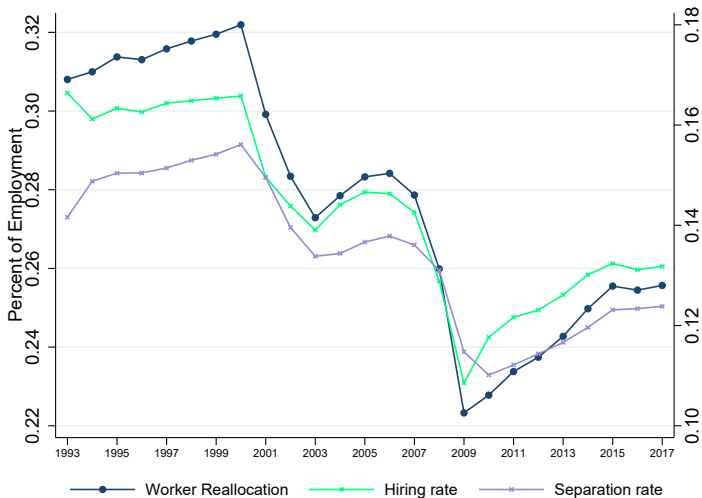
Aggregate payroll job creation and destruction rates



Source: Quarterly Workforce Indicators, U.S. Census Bureau

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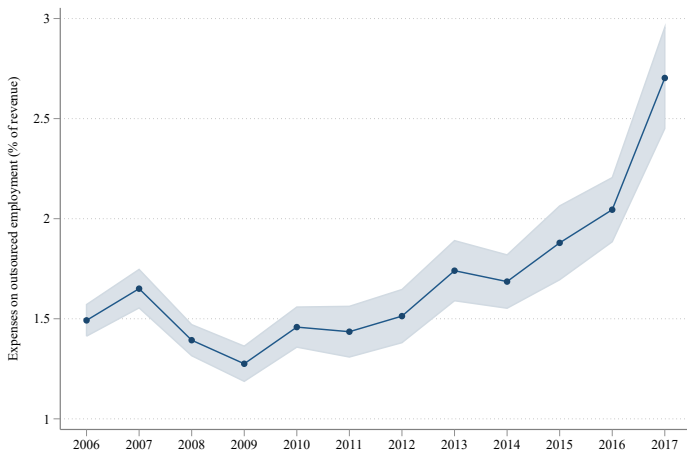
Worker reallocation = hires + separations



Source: Quarterly Workforce Indicators, U.S. Census Bureau

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Expenses on temporary and leased staff are increasing

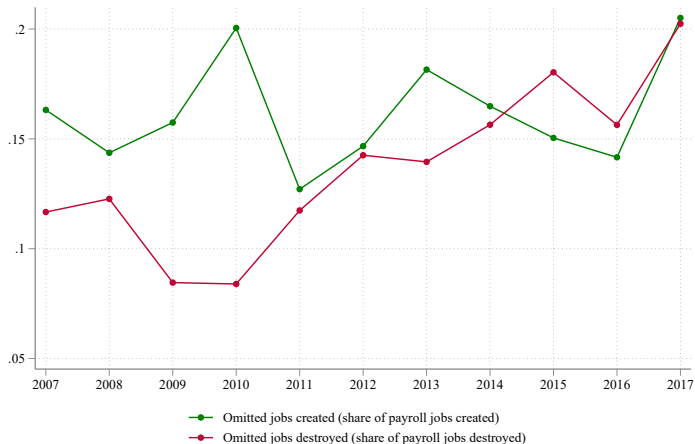


Residualized, average revenue share of expenditures on temporary and leased staff (Source: ASM/CM 2006–2017)

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Staffed job reallocations: business cycle

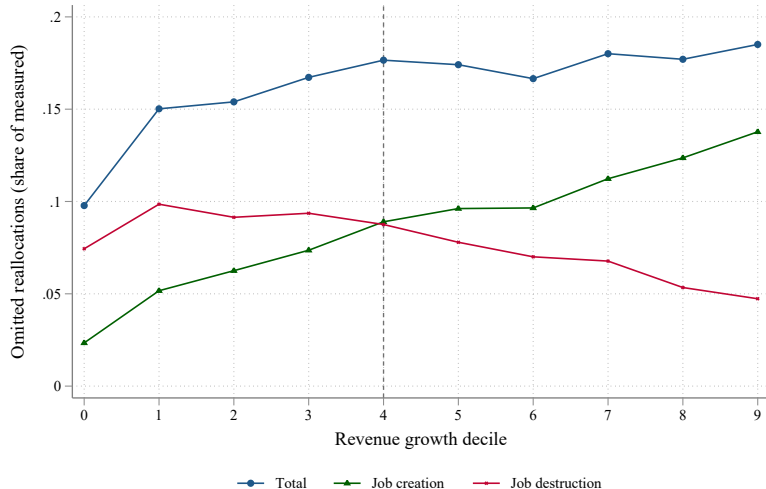
- Gap between omitted job creation and destruction is largest after Great Recession: **underestimation of economic recoveries**



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Evidence from fast-growing plants

- Staffed **net** job creation is highest for fast-growing plants.



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Imputation of staffed **head count** (2)

Recall

$$\text{emp}_{jt}^S = \frac{\exp_{jt}^S}{w_{jt}^S} \cdot \frac{1}{(1 + \alpha)}$$

1. Equalization of wages (upper bound): $w_{jt}^S = w_{jt}^P$
2. Inverse markup = staffing firm σ 's labor share (lower bound):

$$\text{revenues}_{\sigma t} \leq (1 + \alpha)\text{payroll}_{\sigma t} \Leftrightarrow \frac{1}{1 + \hat{\alpha}} = \frac{\text{payroll}_{\sigma t}}{\text{revenues}_{\sigma t}} \equiv \beta_{\sigma t}$$

- Strong competition among staffing agencies + ASA data for $\alpha \in [0.10, 0.15]$
3. Agency-client relationships are unobserved; infer $\beta_{\sigma t}$ from *average* staffing agency in state $s(j)$ and year t .

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Staffed job reallocations

- Given a measure for staffed **head count**, we can also create job reallocation rates *for staffed workers*:

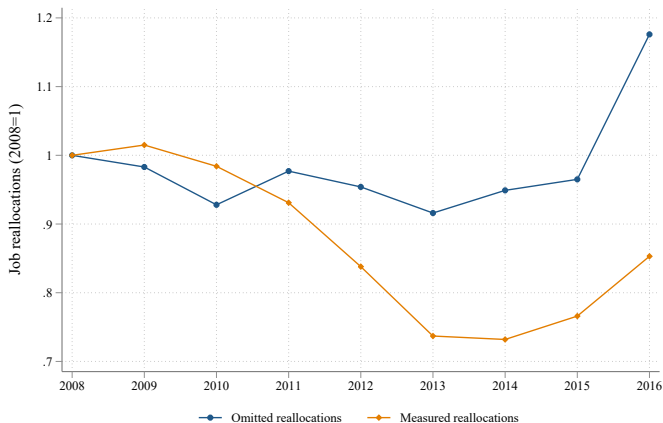
$$\begin{aligned} SJR_t &\equiv \sum_{j \in \mathcal{S}_{t-1,t}} |\widehat{\text{emp}}_{jt}^S - \widehat{\text{emp}}_{jt-1}^S| \\ &= \sum_{j \in \mathcal{S}_{t-1,t}^+} (\widehat{\text{emp}}_{jt}^S - \widehat{\text{emp}}_{jt-1}^S) + \sum_{j \in \mathcal{S}_{t-1,t}^-} (\widehat{\text{emp}}_{jt}^S - \widehat{\text{emp}}_{jt-1}^S) \\ &\equiv SJC_t + SJD_t \end{aligned}$$

- $\widehat{\text{emp}}_{jt}^S$: estimated, **staffed** employment by establishment j in year t

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Staffing job reallocations have increased

- Job reallocations of temp and leased staff 23% \uparrow vs. 12% \downarrow of payroll reallocations
- Omitted reallocations would have lowered the observed secular decline in JR by 38%.



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Staffed employment 23%↑

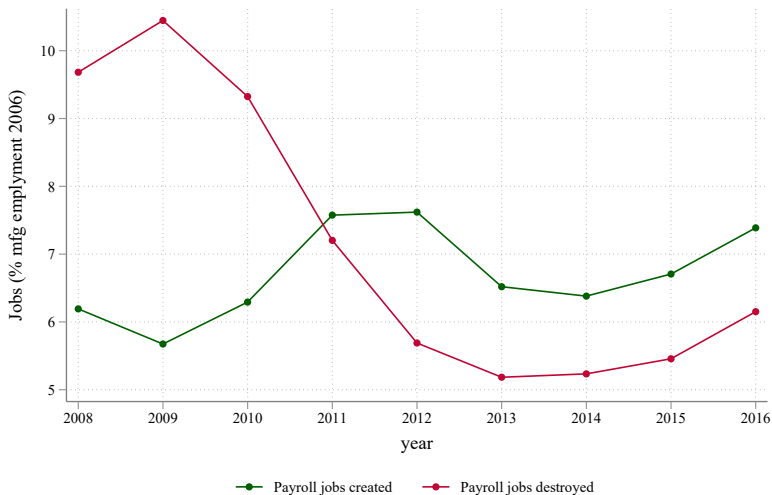
- Over 2006-2017, the manufacturing sector created more staffed jobs than it destroyed.



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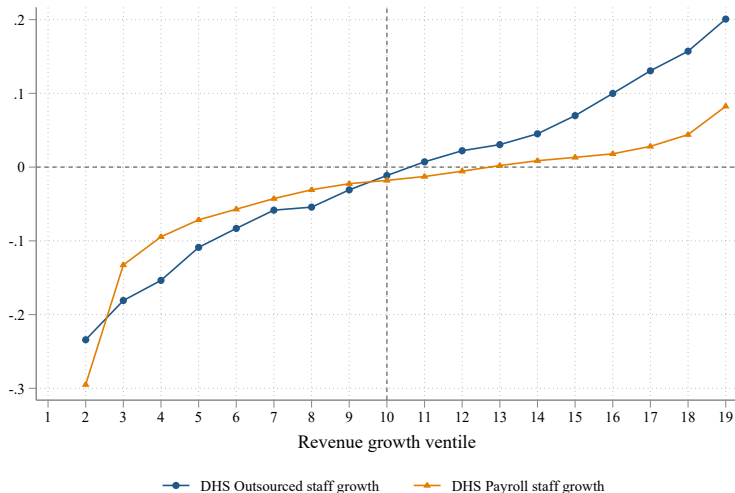
Payroll employment 12%↓

- Job destruction drives the negative, overall trend.



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Payroll employment vs. temporary and leased staff growth



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Productivity and employment effects

- Productivity vs. wage loss/ unemployment (Bilal and Lhuillier, 2021)
- ◇ Rise in aggregate output of 6% (France, 1997–2016)
- Annual labor productivity growth between 2007 and 2015 in manufacturing is 15% lower once the hours of temporary workers are considered (Dey et al., 2017)
- The 4.1% decline in payroll manufacturing employment between 1989 to 2000 becomes an estimated 1.4% *increase* after factoring in temporary workers (Dey et al., 2017)

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Idea behind revenue growth regressions

- Identical assumptions to Yeh et al. (2022)
- First-order conditions from plant j 's cost minimization problem:

$$\frac{F_{jt}^{\ell^P}}{\exp_{jt}^{\ell^P}} \cdot \text{rev}_{jt} = \mu_{jt} \cdot \nu_{jt}$$

$$\frac{F_{jt}^{\ell^S}}{\exp_{jt}^{\ell^S}} \cdot \text{rev}_{jt} = \mu_{jt}$$

- Wedges (i.e., ratios between output elasticities and revenue shares) reflect market power.
- Then, log changes in labor expenditures are proportional to changes in revenues:

$$\Delta \exp_{jt}^{\ell^c} = \beta \cdot \Delta \text{rev}_{jt} + \mathbf{X}'_{jt} \gamma + \varepsilon_{jt} \quad \text{for } c \in \{P, S\}$$

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Responsiveness: revenue shocks

- Cost minimization motivates **revenue** shocks [Derivation](#)

$$\Delta_{\tau} \exp_j^{\ell^c} = \beta_0 \cdot \Delta \text{rev}_{jt} + \mathbf{X}'_{jt} \gamma + \varepsilon_{jt} \quad \text{for } c \in \{P, S\}$$

- Instrument Δrev_{jt} by exploiting trade linkages of manufacturers:
 1. Real price changes of imported goods
 2. Fluctuations in real exchange rates for exporters
- Two instruments are constructed with administrative data from the universe of import and export transactions (LFFTD) [Details](#)

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Instruments for revenue growth regressions

- Industry-year level instruments:

1. **Import price inflation index**

Expenditure-weighted average of changes in products' prices

Products are defined as 10-digit HS-country pair.

2. **Real exchange rate change index** (exporters only)

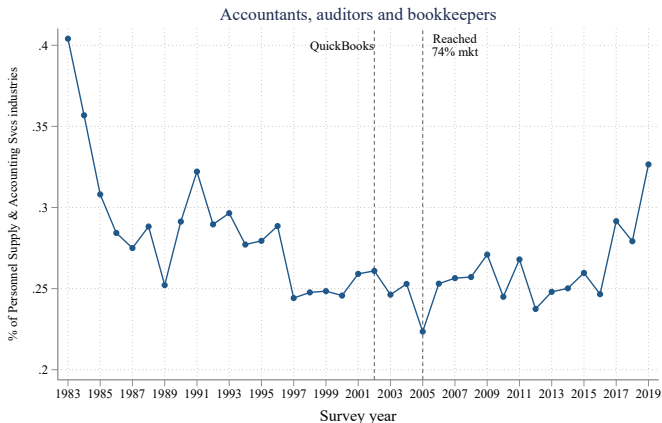
Expenditure-weighted average of real exchange rate changes (between US and foreign country)

IDENTIFYING ASSUMPTION. Idiosyncratic, unobservable factors are orthogonal to real import price/exchange rate changes.

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Staffing and technology

- QuickBooks is an accounting software package widely used by firms.



Source: CPS-ACES data [Back](#)

Responsiveness: productivity shocks

- Empirical design similar to Decker et al. (2022) uses idiosyncratic productivity shocks:

$$\Delta_{\tau} \text{emp}_j^c = \alpha_{it} + \beta_1 \cdot \Delta a_{jt} + \mathbf{X}'_{jt} \gamma + \varepsilon_{j\tau}$$

with $c \in \{P, S\}$ and $\tau \in \{(t-1, t), (t, t+1), (t+1, t+2)\}$

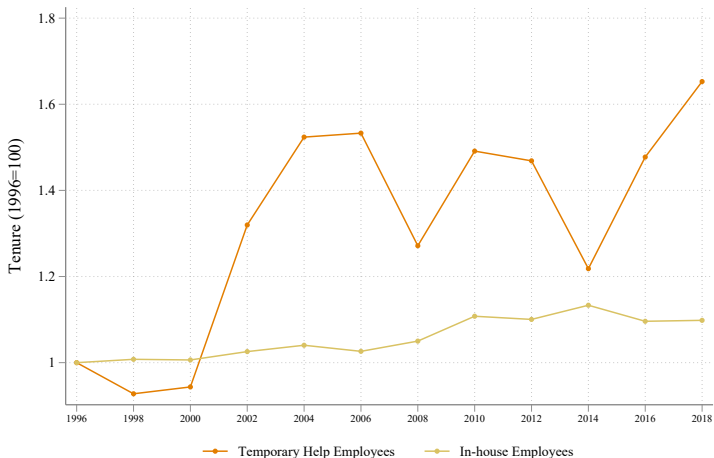
- Revenue TFP: $\Delta a_{jt} = \ln(\text{TFPR}_{jt}^S) - \ln(\text{TFPR}_{jt-1}^S)$
- Extensive margin of staffing:

$$\Delta_{\tau} \text{emp}_j^S = \begin{cases} 2 \times \frac{\text{emp}_{j\tau}^S - \text{emp}_{j\tau-1}^S}{\text{emp}_{j\tau}^S + \text{emp}_{j\tau-1}^S}, & \text{if } \text{emp}_{j\tau}^S + \text{emp}_{j\tau-1}^S > 0 \\ 0 & \text{otherwise} \end{cases}$$

Controls \mathbf{X}_{jt} : change in productivity interacted with linear trend, third-degree polynomial of productivity change, initial employment size, initial employment size interacted with linear trend, plant age, state FE, and cyclical indicators

Staffed workers' tenure in staffing agencies is increasing

- Tenure of average staffing worker 18m↑ (payroll worker 8m↑)
- Average assignment length at client is 11 weeks.



Source: Job tenure supplement of CPS [Back](#)

Volatility-staffing share regressions

- Volatility and staffed revenue shares are positively correlated.
- Stronger correlation when volatility is skewed towards positive growth.

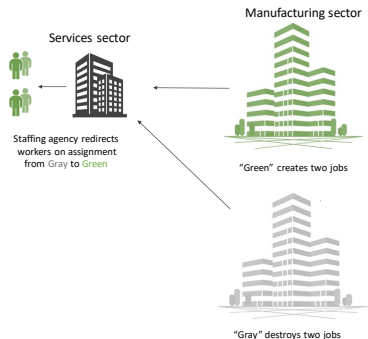
	Standard volatility	Positive-biased volatility
Staffing revenue share	0.2448 (0.0320)	0.3377 (0.0441)
Controls/fixed effects		
Size	Yes	Yes
Age	Yes	Yes
Industry-year	Yes	Yes
State	Yes	Yes
OBSERVATIONS	350,000	350,000

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Undercounting reallocations

[label=example_omittedreall]

	Traditional measurement			Economics		
	t	$t+1$	Δ	t	$t+1$	Δ
Agency	4	4	0	0	0	0
Green	2	4	0	2	4	+2
Gray	2	0	0	2	0	-2
Aggregate JR			0			4



- jobs are created and destroyed, flows are only counted if payrolls change
- manufacturing is creating/destroying jobs... but they are counted (if at all) in the business services' industry!