

# The Labor Market Impact of Noncompete Contracts: Job retention vs. Job creation

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# Introduction

- Growing concern about a general reduction in competition among firms (Furman and Orszag, 2015).
- Potential driver: **Non Compete Agreements (NCA)** in employment contract. That is:

- A form of restrictive covenant.
- An agreement that keeps employees from competing
  - during an average period of 18 months after job termination
  - and or around a geographic economic scope.
- A form of protection from departing employee
  - The risk is real.
- State law: permissive in many states v.s. banned in California



**COVENANT NOT TO COMPETE AND NON-DISCLOSURE AGREEMENT**

**PARTIES:**

Michael Spillane ("EMPLOYEE")  
  
and  
  
NIKE, Inc., and its parent, divisions, subsidiaries, affiliates, successors and assigns ("NIKE"):

**AGREEMENT:**

In consideration of the foregoing, and the terms and conditions set forth below, the parties agree as follows:

1. **Covenant Not to Compete.**
- (a) **Competition Restriction.** During EMPLOYEE's employment by NIKE, under the terms of any employment contract or otherwise, and for one (1) year thereafter (the "Restriction Period"), EMPLOYEE will not directly or indirectly own, manage, control or participate in the ownership, management or control of, or be employed by, consult for or be connected in any manner with, any business engaged anywhere in the world in the athletic footwear, athletic apparel or sports equipment, sports electronics/technology and sports accessories business, or any other business that directly competes with NIKE or any of its parent, subsidiaries or affiliated corporations (a "Competitor"). This provision is subject to NIKE's option to waive all or any porti

/s/ Michael Spillane

/s/ David Ayre

Michael Spillane  
\_\_\_\_\_  
Name

David Ayre  
\_\_\_\_\_  
Name

4/26/2015  
\_\_\_\_\_  
Date

EVP, Global Human Resources  
\_\_\_\_\_  
Title

5/4/2015  
\_\_\_\_\_  
Date

## Why do we care?

### Prevalence of Non-compete

- **20%** of US workers in 2014 (survey by Prescott, Bishara, and Starr (2016))
- **64%** of executives in public-listed firms (average 1995-2015, Shi et al. (2019))
- **17%** of 31-34 aged active population in 2017 (NLYS97 survey)
- **12%** of  $\leq \$20,000$  in annual earning and **15%** of those in \$20,000-\$40,000 earning brackets

### Trade-off :

- **Restrict labor mobility** vs. **encourage firm investment** (Shi et al. (2019), Garmaise (2011), Lavetti, Simon, and White (2014),...)

⇒ NCAs nationwide ban already in Biden's administration agenda.

*"... In the American economy, companies compete. Workers should be able to compete, too..."*      Joe Biden, during the campaign

# This paper

- Study the equilibrium labor market effects of Non Compete contract.
- Based on Search and matching Model
- + Non-compete contract + endogenous investment in worker human capital
- Quantify the equilibrium effect of the NCAs ban.
- Analyze the welfare implications of Non-compete contract.

# Outline

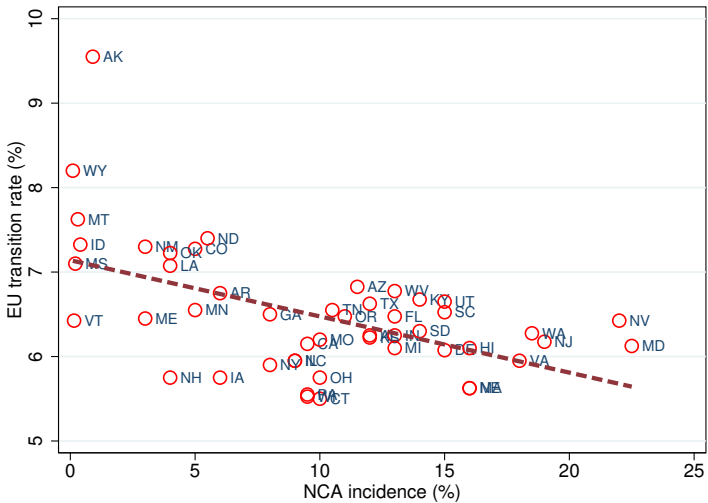
Motivating facts

Model set up

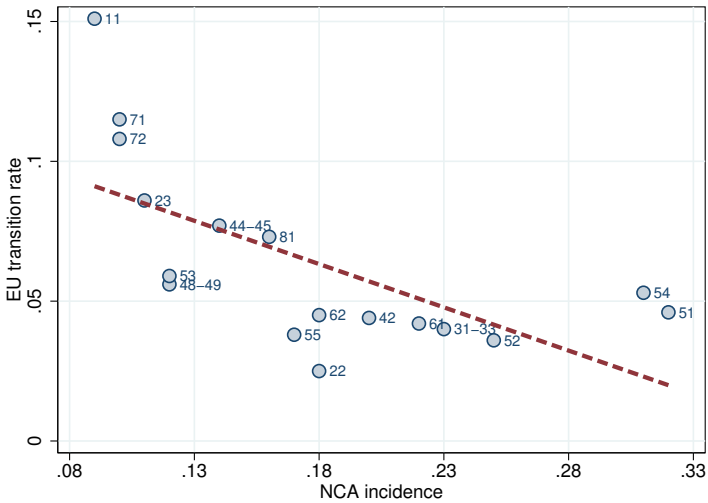
Model

Fact #1: Higher NCAs incidence is associated with lower average job separation rate.

(a) : States

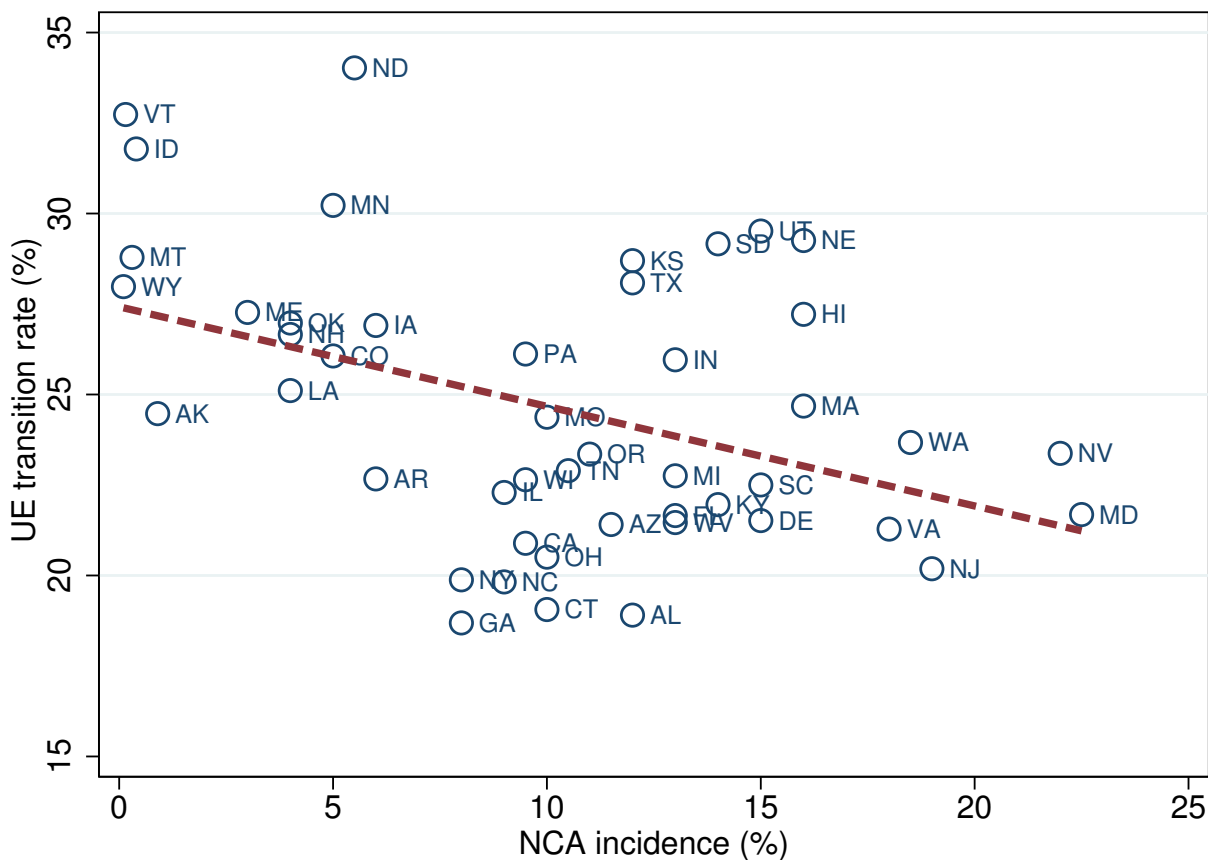


(b) : Industries (2-digit)



Note.-. EU data come from Longitudinal Employer-Household Dynamics (LEHD), 2014 and NCAs incidence data come from Non-competes survey, 2014 (Prescott, Bishara, and Starr 2016) .

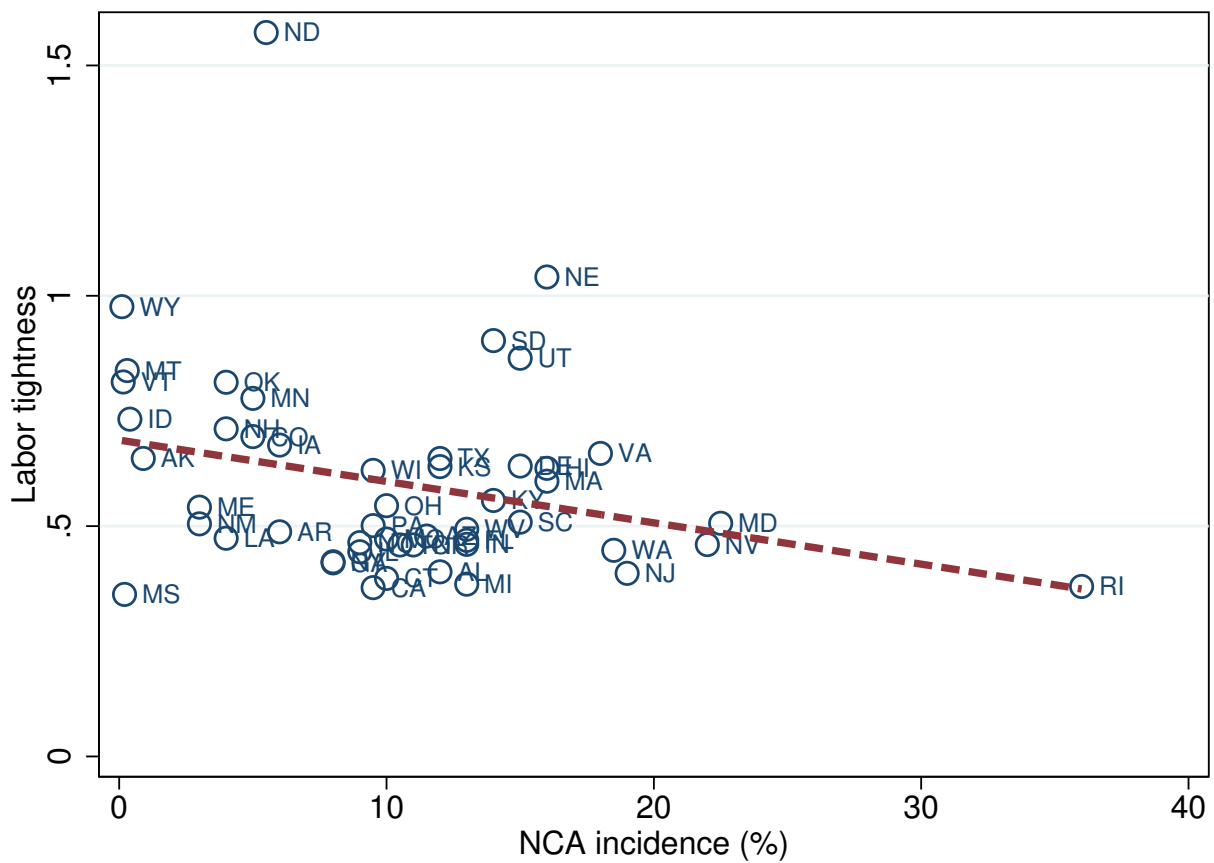
Fact #2: Higher NCAs incidence is associated with lower average job finding rate



Note.-. UE data estimated from CPS basic monthly files, 2014 and NCAs incidence data come from Non-competes survey, 2014.



Fact #3: Higher NCAs incidence is associated with lower labor market tightness



Note.-. labor tightness data are estimated from JOLTS, 2014 and NCAs incidence data come from Non-competes survey, 2014.

# NCA incidence and Labor Market Transition: Empirical Analysis

$$y_{ist} = \alpha + \beta NCA_{sj} + \gamma Controls_{it} + \lambda_s + v_t + \varepsilon_{ist}$$

Dependent var.	OLS		OLS	
	UE (Y/N)	EU (Y/N)	UE (Y/N)	EU (Y/N)
NCA inc.	-0.130*** (0.0004)	-0.023*** (0.0000)		
NCA inc. × Enforce (State)			-0.155*** (0.0005)	-0.029*** (0.0000)
Controls	✓	✓	✓	✓
Year FE	✓	✓	✓	✓
State FE	✓	✓	✓	✓
N. Obs	19141	250,876	19141	250,876

Note.- Data come from CPS monthly file 2012-2014. Transition status constructed following (Albert 2021).

Controls include demographics such as *gender*, *race*, *education*, *age* and *age squared*. Standard errors in parenthesis, clustered at state level. \* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$

- 10% increase in NCAs incidence
  - lower monthly average job separation rate by 0.23 p.p (magnitude larger in higher enforcement state like Florida) → (Job retention effect)
  - lower monthly average job finding rate by 1.3 p.p (magnitude larger in higher enforcement state like Florida) → (Job creation effect)

# Outline

Motivating facts

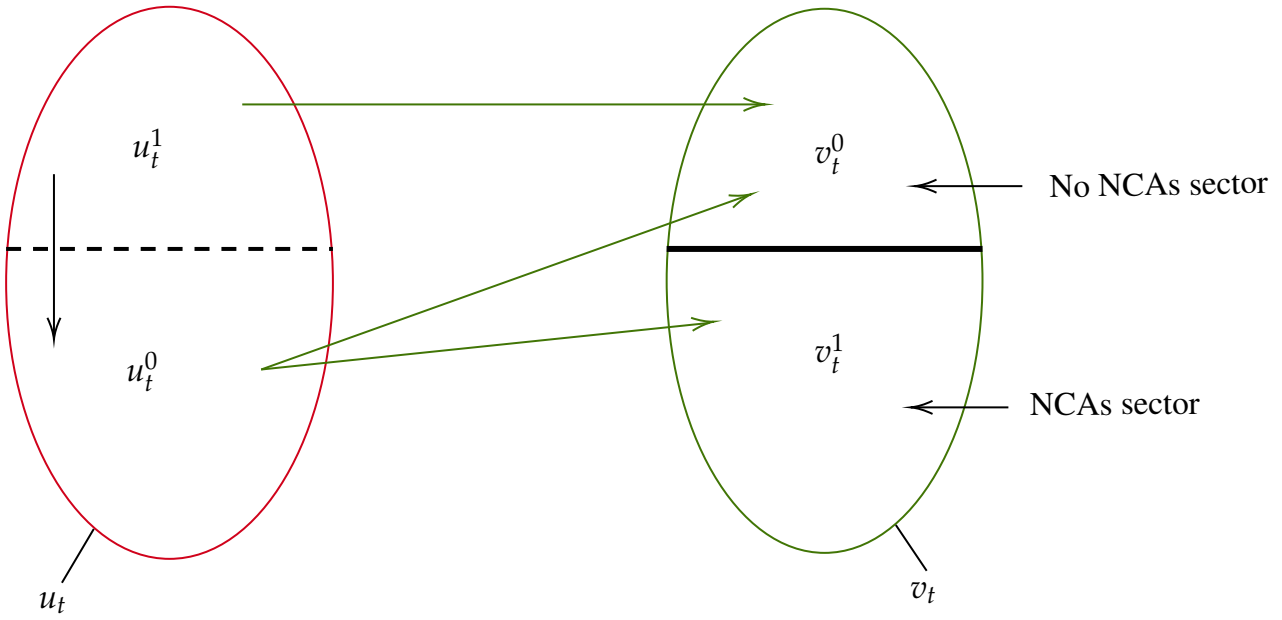
Model set up

Model

## Simple Setup

- ▶ Two sectors DMP model (sector with and without NCAs) and No On the-job-search.
- ◇ Firms:
  - ◇ Exogenously enter sector and offer one of the two types of vacancies : one requiring NCA ( $b = 1$ ) in proportion  $\phi$  and the other free of NCA ( $b = 0$ ) .
  - ◇ Invest in worker training. Training investment is denoted  $i$  and incurs a convex cost  $C(i) = ci^2$ .
- ◇ Workers :
  - ▶ Employed with NCAs ( $b = 1$ ) or not  $b = 0$ . Employed worker enters unemployment with her NCA status inherited from working state. Becoming free of NCAs with proba  $\mu$ .
  - ▶ Key : **NCAs restrict worker employment opportunities (low job finding rate)**.
  - ▶ Once employed, worker faces preference shock  $\varepsilon$  affecting her marginal benefit of working. Assuming  $\varepsilon \sim \text{iid } G$ , only observable by workers.
  - ▶ Employed worker produces  $y(i) = p + i$ , where  $p > 0$  is common productivity.

# NCAs post employment restriction (Model illustration)



## Model predictions and mechanism (Key Takeaways)

- $\uparrow$  NCAs incidence  $\implies \uparrow$  proportion of job seekers constrained by NCAs.
- NCAs worker receives higher training.
  - NCAs incidence  $\implies \text{Outside opt.}(1) < \text{Outside opt.}(0) \implies \text{Surpl.}(1) > \text{Surpl}(0)|_i \implies \text{Sep.}(0) > \text{Sep}(1)|_i \implies \text{Marg. benef.}(1) > \text{Marg. benef.}(0) \implies i(1) > i(0)$ .

Figure



- NCAs worker experiences higher tenure  $\implies$  decreasing separation rate with NCAs incidence.
- NCAs incidence has two opposing effect on Labor tightness (Training effect (+) and job seekers NCAs composition effect (-)).
- Two opposing effect on unemployment rate (job finding rate effect dominates): Unemployment rate increases with NCAs incidence.

# Outline

Motivating facts

Model set up

Model

# Matching

- Assuming a standard Cobb-Douglas matching function:

$$m(u, v) = Au^\alpha v^{1-\alpha}$$

where  $u = u(0) + u(1)$ .

- $u(1)$  and  $u(0)$  are measures respectively of NCA constrained and unconstrained unemployed workers.
- $\theta = v/u$  is labor tightness and  $f(\theta)$ ,  $q(\theta)$  respectively the average job arrival rate and job filled rate :

$$f(\theta) = \frac{m(u, v)}{u} = A\theta^{1-\alpha} \quad ; \quad q(\theta) = \frac{m(u, v)}{v} = A\theta^{-\alpha}$$

- Denote  $\eta = u(0)/u$  the probability for firm to meet unemployed worker free of NCA.
- Upon meet prospective employer with proba.  $f(\theta)$ , worker enters NCAs with proba  $\phi$ .
- Upon a vacancy encounters unemployed with proba  $q(\theta)$ , it becomes NCAs job with proba  $\eta$ .



## Workers values

- Employed worker with training  $i$  and NCA status  $b$  value is :

$$W(b, i) = w(b, i) + \beta \mathbb{E}_\varepsilon \max_{x(b, i)} \left\{ (1 - x(b, i))(W(b, i) + \varepsilon) + x(b, i)U(b) \right\} \quad (1)$$

- $x(b, i)$  summarises the job quit decision and is such that :

$$x(b, i) = \begin{cases} 1 & \text{if } W(b, i) + \varepsilon \leq U(b) \\ 0 & \text{otherwise} \end{cases}$$

- Unemployed worker value free of NCA ( $b = 0$ ) is given by :

$$U(0) = z + \beta \left\{ f(\theta) [\phi W(1, \bar{i}_1) + (1 - \phi) W(0, \bar{i}_0)] + [1 - f(\theta)] U(0) \right\} \quad (2)$$

- Unemployed worker value with NCA status ( $b = 1$ ) is given by :

$$U(1) = z + \beta \left\{ f(\theta) (1 - \phi) [W(0, \bar{i}_0)] + [1 - (1 - \phi)f(\theta)] \mathbb{E}[U(b')] \right\} \quad (3)$$

where :

$$b' = \begin{cases} 1 & \text{w.proba } 1 - \mu \\ 0 & \text{w.proba } \mu \end{cases}$$

## Firms values

- Value of filled job with NCAs status  $b$  and at a training level  $i$  is :

$$J(b, i) = p + i - w(b, i) + \beta \left\{ G(\bar{\varepsilon}(b, i))V + (1 - G(\bar{\varepsilon}(b, i)))J(b, i) \right\} \quad (4)$$

- Vacancy value  $V$  is given by :

$$V = -\kappa + \beta \max_{i_0, i_1} \left\{ q(\theta) \left[ \phi [\eta (J(1, i_1) - C(i_1)) + (1 - \eta)V] + (1 - \phi) [J(0, i_0) - C(i_0)] \right] + [1 - q(\theta)]V \right\}$$

- Using (4), **Optimal Condition for Investment (OCI)**:

$$C'(i) = \underbrace{\frac{1}{1 - \beta(1 - G(\bar{\varepsilon}(b, i)))}}_{\text{Average match duration}} \left[ \underbrace{1 - \frac{\partial w(b, i)}{\partial i}}_{\text{Direct marginal profit}} \underbrace{- \beta \frac{\partial G(\bar{\varepsilon}(b, i))}{\partial i} J(b, i)}_{\text{Expected marginal benefit from } \Delta \text{ in quit proba.}} \right] \quad (5)$$

- If wage independent on training, then OCI implies :
  - Training intensity is higher in vacancy associated to higher expected employment duration.
- Result holds even after **wage adjustment?** (Quantitative analysis)

## Free-entry and Job creation condition

- Free entry :  $V = 0 \implies$

$$\frac{\kappa}{q(\theta)} = \beta \left\{ \underbrace{\eta \phi \overbrace{[J(1, i_1^*) - C(i_1^*)]}^{\pi_1} + (1 - \phi) \overbrace{[J(0, i_0^*) - C(i_0^*)]}^{\pi_0}}_{\text{Marginal Benefit (MB)}} \right\} \quad (6)$$

where  $i_b^*$  is optimal level of investment in worker of type  $b$ .

- If NCAs training motive strong enough then,  $\uparrow \phi \implies \uparrow \theta$
- If NCAs unemployed composition effect strong then,  $\uparrow \phi \implies \downarrow \theta$

## Wages bargaining

- Wage is set by Nash bargaining.
- Bargaining outcomes :  $J(b, i) = (1 - \rho)S(b, i)$  and  $W(b, i) - U(b) = \rho S(b, i)$ .
- $\rho$  stands for worker bargaining power.
- Surplus  $S(b, i)$  (sufficient statistic) solves:

$$(1 - \beta)S(b, i) = y(i) - (1 - \beta)U(b) + \beta \int_{-\rho S(b, i)} \varepsilon dG(\varepsilon) - \beta [G(-\rho S(b, i))] S(b, i) \quad (7)$$

wage is given by:

$$w(b, i) = \rho(p + i) + (1 - \rho) \left[ (1 - \beta)U(b) - \underbrace{\beta \int_{-\rho S(b, i)} \varepsilon dG(\varepsilon)}_{\gamma(b, i)} \right] \quad (8)$$

- Standard reservation wage distorted by average preference shock

## Labor market equilibrium

A stationary equilibrium consists of value functions  $W(b, i)$ ,  $U(b)$ ,  $J(b, i)$ ,  $S(b, i)$  policy functions  $\bar{\epsilon}(b, i)$ ,  $i(b)$ , wage  $w(b, i)$ , labor market tightness  $\theta$  and unemployment rate such that :

- (i) The value functions solve (1) to (4)
- (ii) Wage is given by (8)
- (iii) Training policy function satisfies (6)
- (iv) Free entry (6) pins down labor tightness
- (v) Quit decision policy function satisfies  $\bar{\epsilon}(b, i) = -\rho S(b, i)$  and
- (vi) Unemployment rate is derived from equivalence between flow from and into unemployed pool :

$$\left[ \mu + (1 - \phi) f(\theta) \right] u(1) = \phi (1 - u) G(\bar{\epsilon}(1, i^*(1))) \quad (9)$$

$$u(0) f(\theta) = \mu u(1) + (1 - \phi) (1 - u) G(\bar{\epsilon}(0, i^*(0))) \quad (10)$$

that is :

$$u = \frac{\delta}{\left[ \eta + (1 - \phi)(1 - \eta) \right] f(\theta) + \delta} \quad (11)$$

where  $\delta = (1 - \phi) G(\bar{\epsilon}(0, i^*(0))) + \phi G(\bar{\epsilon}(1, i^*(1)))$

# Calibration

- In Monthly frequency

Table: Calibrated parameters

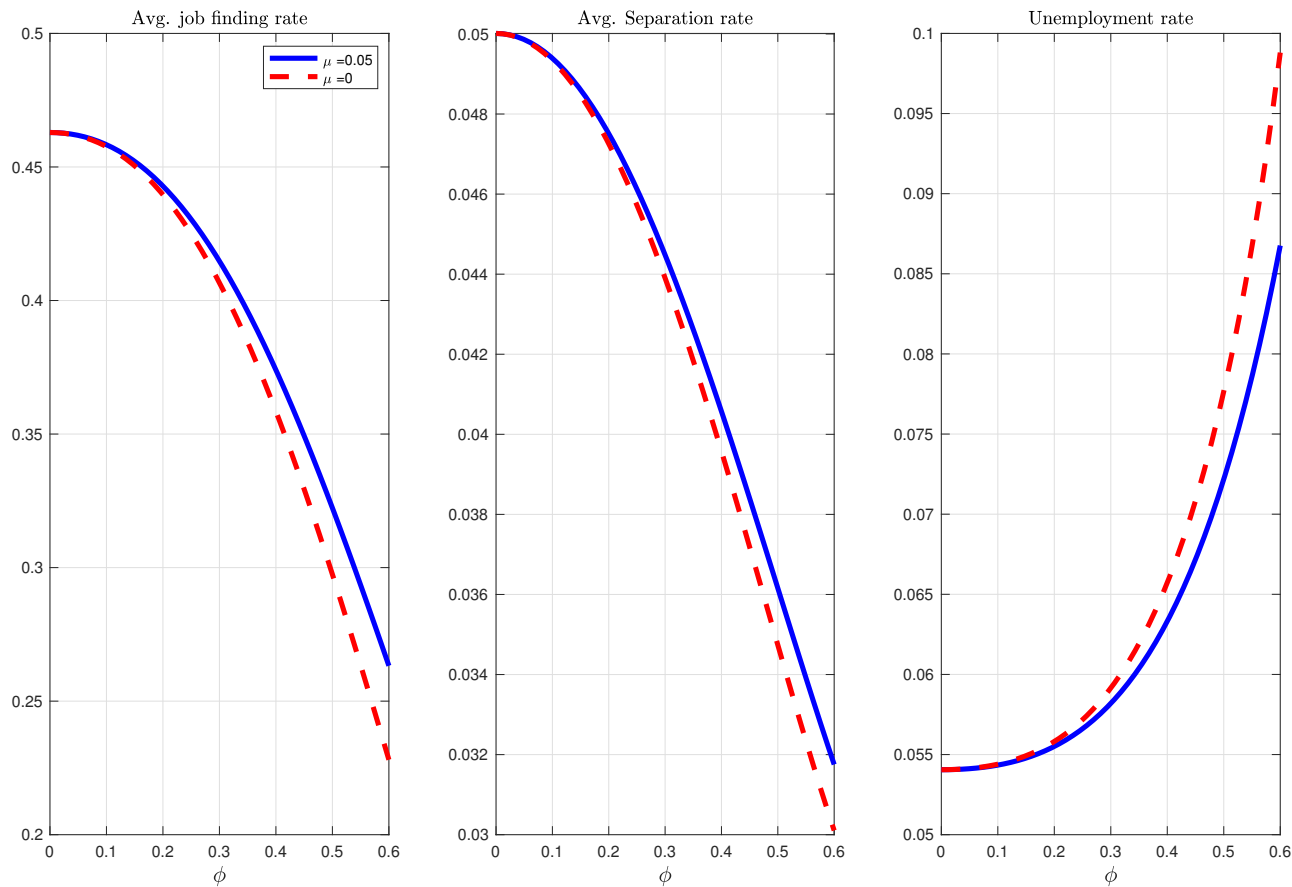
Parameters	Name	Value	Reason
Predetermined			
$\beta$	Discount rate	0.9967	Interest rate=4%
$\rho$	Bargaining power	0.5	(Leduc & Liu, 2019)
$\phi$	fraction of bound worker	0.20	Starr, 2018
$\mu$	Proba. of being unconstrained	0.052	1.6 years of NCA
$z$	Employment benefit	0.40	Shimer, 2005
$p$	Common productivity	1	Normalization
$m$	Preference shock mean	0	Normalization
$A$	Matching efficiency	0.6364	Avg. Job finding rate
Estimated			
$\kappa$	vacancy cost	0.86	$\theta$
$c$	Training cost parameter	145.5	$i^*(1)/i^*(0)$
$\sigma$	S.t.d parameter	0.533	avg. sep. rate

- Targeted moments

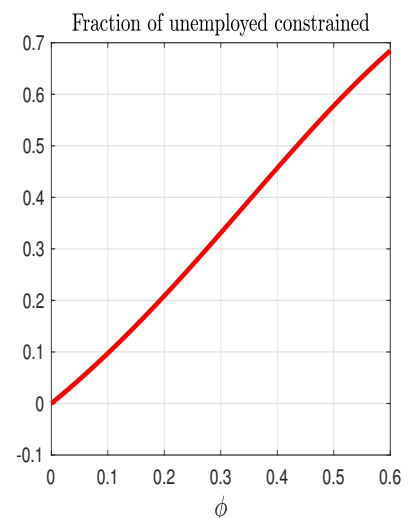
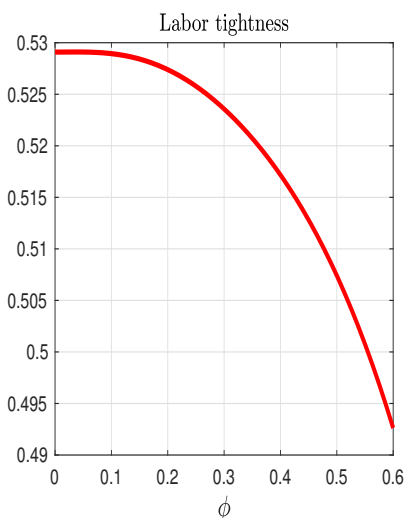
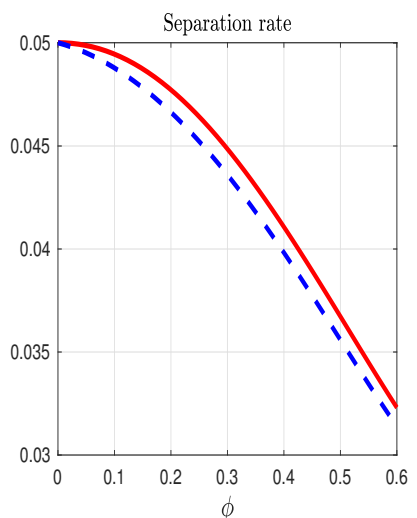
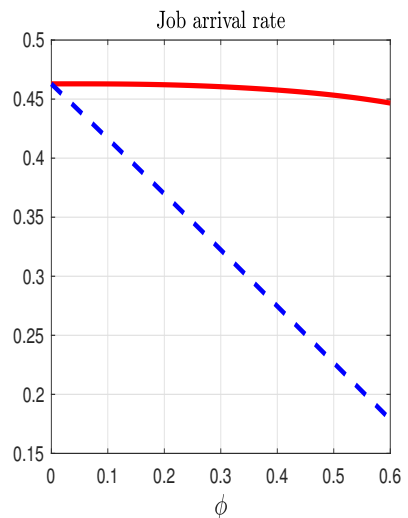
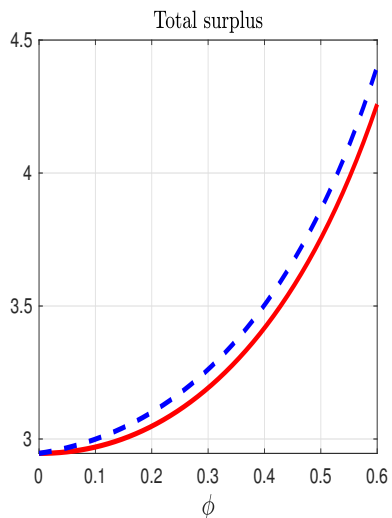
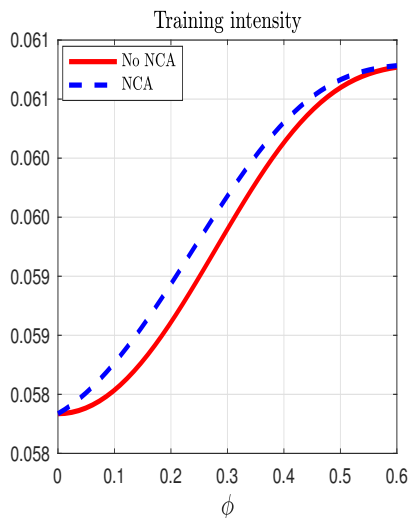
Moments	Data	Model
labor tightness	0.52	0.52
average separation rate	0.027	0.026
$i^*(1)/i^*(0)$	1.28	1.05

⇒ yields a model unemployment rate = 0.056 ≈ 0.055 in data.

# NCA incidence equilibrium effects : Accounting for Fact #1 and Fact #2



# NCA's incidence effect : decentralized equilibrium





## Aggregate effects of eliminating NCAs

Table: Quantitative effects of eliminating NCAs ( $\phi = 0, \mu = 1$ )

	Base	NCAs removal
Job finding rate	44.29	46.29
Job separation rate	2.60	2.65
Unemployment rate	5.55	5.41
Average wage	100	100.02
Output per worker	100	99.92

- Positive effect of NCAs removal on job finding rate (+2 p.p.) translated to a slight decrease in unemployment rate (-0.14 p.p.).

## Conclusion

- NCAs distort labor market outcomes by increasing matching frictions.
- An increase in NCAs incidence lower the probability to find a job but also lower separation rate.
- Eliminating NCAs increase job finding rate and unemployment rate but lower productivity through lower investment.
- Work in progress
  - Efficiency analyze (optimal level of NCAs incidence)
  - More general set up (worker heterogeneity)

# Appendix

# NCA's incidence effect : decentralized equilibrium

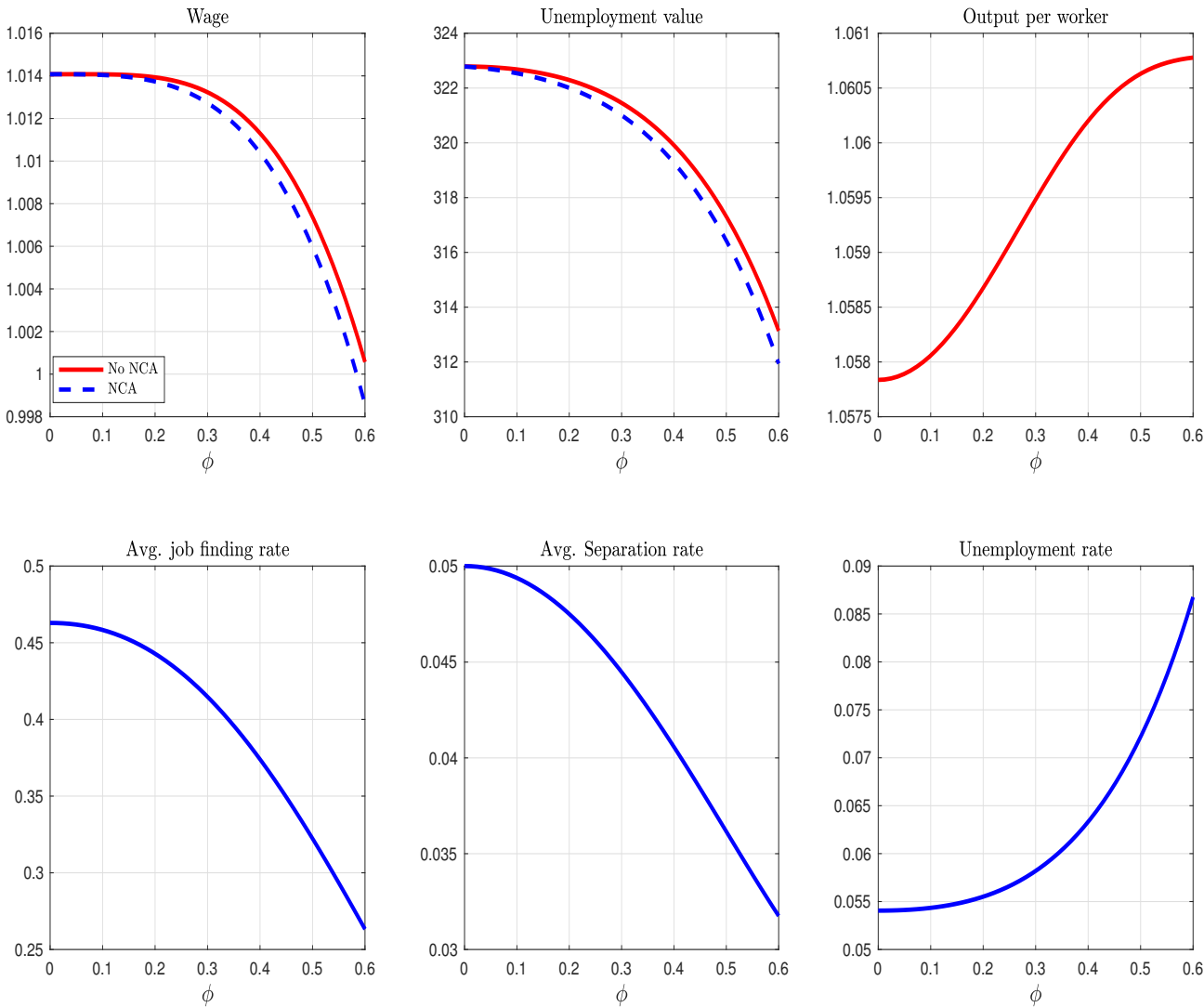


Figure E2: Noncompete from Jimmy Johns

**Non-Competition Covenant.** Employee covenants and agrees that, during his or her employment with Employer and for a period of two (2) years after either the effective date of termination of his or her employment for any reason, whether voluntary or involuntary and whether by Employer or Employee, or the date on which Employee begins to comply with this paragraph, whichever is later, he or she will not have any direct or indirect interest in or perform services for (whether as an owner, partner, investor, director, officer, representative, manager, employee, principal, agent, advisor, or consultant) any business which derives more than ten percent (10%) of its revenue from selling submarine, hero-type, deli-style, pizza and/or wrapped or rolled sandwiches and which is located within three (3) miles of either (1) 9641 N Milwaukee Ave., Niles IL 60714 [Insert address of employment], or (2) any such other JIMMY JOHN'S® Sandwich Shop operated by JJF, one of its authorized franchisees, or any of JJF's affiliates.

Employee also acknowledges and agrees that, for at least twelve (12) months after the effective date of termination of his or her employment for any reason, whether voluntary or involuntary and whether by Employer or Employee, Employee may not become a partner of or investor/owner with, or work for, another JIMMY JOHN'S® Sandwich Shop franchisee. Employee acknowledges that other JIMMY JOHN'S® Sandwich Shop franchisees are contractually prohibited by JJF from recruiting Employee as a partner or investor/owner, or from hiring Employee, for at least twelve (12) months after Employee leaves his or her employment with Employer (regardless of the reason for his or her departure).

## Non-compete Agreement enforcement index

State	CNC Index	State	CNC Index
Alabama (1992–2013)	5	Mississippi (1992–2008)	4
Alaska (1992–2013)	3	Mississippi (2009–2013)	5
Arizona (1992–2013)	3	Missouri (1992–2013)	7
Arkansas (1992–2013)	5	Montana (1992–2013)	2
California (1992–2013)	0	Nebraska (1992–2013)	4
Colorado (1992–2011)	2	Nevada (1992–2013)	5
Colorado (2012–2013)	3	New Hampshire (1992–2013)	2
Connecticut (1992–2013)	3	New Jersey (1992–2013)	4
D.C. (1992–2013)	7	New Mexico (1992–2013)	2
Delaware (1980–2013)	6	New York (1992–2013)	3
Florida (1992–1996)	7	North Carolina (1992–2013)	4
Florida (1997–2013)	9	North Dakota (1992–2013)	0
Georgia (1992–2004)	5	Ohio (1992–2013)	5
Georgia (2005–2013)	6	Oklahoma (1992–2013)	1
Hawaii (1992–2006)	3	Oregon (1992–2013)	6
Hawaii (2007–2013)	4	Pennsylvania (1992–2013)	6
Idaho (1992–2008)	6	Rhode Island (1980–2013)	3
Idaho (2009–2013)	7	South Carolina (1992–2013)	5

# Non-compete Agreement enforcement index

Illinois (1992–2013)	5	South Dakota (1992–2013)	5
Indiana (1992–2013)	5	Tennessee (1992–2013)	7
Iowa (1992–2013)	6	Texas (1992–1994)	5
Kansas (1992–2007)	6	Texas (1995–2013)	3
Kansas (2008–2013)	7	Utah (1992–2013)	6
Kentucky (1992–2013)	6	Vermont (1992–2013)	5
Louisiana (1992–2001)	4	Virginia (1992–2005)	3
Louisiana (2002–2003)	0	Virginia (2006–2013)	4
Louisiana (2004–2013)	4	Washington (1992–2013)	5
Maine (1992–2013)	4	West Virginia (1992–1991)	3
Maryland (1992–2013)	5	West Virginia (1992–2013)	2
Massachusetts (1992–2013)	6	Wisconsin (1992–2013)	3
Michigan (1992–2013)	5	Wyoming (1992–2013)	4
Minnesota (1992–2013)	5		

## Non-compete Agreement index construction

- Q1: Is there a state statute of general application that governs the enforceability of covenants not to compete? States that enforce non-competition agreements outside a sale-of-business context receive a score of 1.
- Q2: What is an employer's protectable interest and how is it defined? States in which the employer can prevent the employee from future independent dealings with all the firm's customers, not merely with the customers with whom the employee had direct contact, receive a score of 1.
- Q3: What must the plaintiff be able to show to prove the existence of an enforceable covenant not to compete? Laws that place greater weight on the interests of the firm relative to those of the former employee are above the threshold.
- Q4: Does the signing of a covenant not to compete at the inception of the employment relationship provide sufficient consideration to support the covenant? States for which the answer to Question 4 is clearly "Yes" are above the threshold.
- Q5: Will a change in the terms and conditions of employment provide sufficient consideration to support a covenant not to compete entered into after the employment relationship has begun? States for which the answer to Question 5 is clearly "Yes" are above the threshold.
- Q6: Will continued employment provide sufficient consideration to support a covenant not to compete entered into after the employment relationship has begun? States for which the answer to Question 6 is clearly "Yes" are above the threshold.



## Non-compete Agreement index construction

- Q7: What factors will the court consider in determining whether time and geographic restrictions in the covenant are reasonable? Jurisdictions in which courts are instructed not to consider economic or other hardships faced by the employee are above the threshold.
- Q8: Who has the burden of proving the reasonableness or unreasonableness of the covenant not to compete? States in which the burden of proof is clearly placed on the employee are above the threshold.
- Q9: What type of time or geographic restrictions has the court found to be reasonable? Unreasonable? Jurisdictions in which 3-year statewide restrictions have been upheld receive a score of 1.
- Q10: If the restrictions in the covenant not to compete are unenforceable because they are overbroad, are the courts permitted to modify the covenant to make the restrictions narrower and to make the covenants enforceable? States for which the answer to Question 10 is clearly “Yes” are above the threshold.
- Q11: If the employer terminates the employment relationship, is the covenant enforceable? States for which the answer to Question 11 is clearly “Yes” are above the threshold.
- Q12: What damages may an employer recover and from whom for breach of a covenant not to compete? If, in addition to lost profits, there is a potential for punitive damages against the former employee, the state receives a score of 1. States that explicitly exclude consideration of the reasonableness of the contract from the calculation of damages are also above the threshold.