Dynamic Monopsony with Large Firms and Noncompetes

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twofold contribution

1. develop a generalized job ladder framework with wage posting
   - rich and flexible, yet tractable
   - natural laboratory for labor mobility themes

2. application to noncompete agreements
   - theoretical: can sharply suppress wages
   - quantitative: blanket ban in US, compute wage gains depending on local labor market features

framework for anti-competitive labor market practices

- frictional labor market with wage posting and turnover due to on-the-job search (Burdett-Mortensen (98))
- several new features:
  1. large employers
     - can speak to concentration, mergers, ...
  2. decreasing returns
     - can endogenize size and market structure
  3. market-level product demand curve (two-sided market power)
     - less restrictive, wider range of cases
  4. hiring cost, rather than vacancy cost
     - more tractable (and relevant)
- natural lab for competition issues related to worker mobility and turnover

assessing non-competes

1. impact of noncompetes on the labor market
   - can sharply depress wages when wide-spread, unraveling competition
   - strong spillovers to other firms
   - misallocation of workers across firms
   - welfare impact ambiguous since competition via turnover is inefficient

2. quantitative impact of noncompetes on wages
   - large when
     - market is concentrated
     - turnover costs are high
     - product demand is inelastic

3. measurement of labor market competition
   - careful with interpretation of
     - cross firm wage differentials for impact of noncompetes
     - quit elasticities and mark-downs for labor market competitiveness

lit

- modern/dynamic monopsony (Burdett-Mortensen (98), Manning (03, 11,...), Dube et al (19,20))
- neoclassical monopsony (Robinson (33), Card et al (16), Berger et al (22))
- size and market structure with frictions: Jarosch et al. (23)
- non-competes in a frictional setting w/ bargaining: Shi (22)

model (w/o noncompetes)

model

standard pieces: random search, on-the-job-search, posted wages (BM)

- relative search efficiency of employed s
- firms commit to pay posted wage
- may post mix of wages, cdf $F_j(w)$
- workers become unemployed at rate δ, then receive flow utility b
- choose a reservation wage, otherwise just float up the job ladder
- cont. time, discount rate r
- restrict to stationary equilibria

not-so-standard pieces

- hiring technology: firms pay a cost c per hire
  - always obtain desired size, no vacancy cost
  - but lose workers to unemployment and competitors, so costly turnover
  - workers contact firm i with endogenous frequency ψ_i ($s\psi_i$)
- granular market structure: M large firms
- d.r.s: firm i with employment N produces homogeneous output $x_i N^\alpha$
- reverse-engineer downward sloping market-level product demand

firm problem in words

- firm choose
  - intensity at which workers contact their job openings, ψ_i
  - distribution of posted wages $F_i(w)$
- to maximize revenue net of wage bill and turnover cost
- taking as given (standard Nash)
  - the reservation wage
  - each other's actions

solution

- despite added dimensions remains highly tractable
  - w/ symmetric firms: can solve model by hand
  - w/ heterogeneous firms (x_i, c_i): simple algorithms to construct equilibria

concentration and wages

- more concentration can, but need not hurt workers
  - PE: firms do not compete with themselves, fewer competitors lower pay
  - GE: lower turnover drives up labor demand

equilibrium markdowns

- $m \equiv$ marginal revenue product of labor
- $\Rightarrow$ optimal hiring + user cost equated across all wages posted:

$$\frac{m - w}{r + \delta + \sum_{j \neq i} s\psi_j \left(1 - F_j\left(w\right)\right)} = c_i$$

- Mark-down m/w is endogenous and covers turnover cost
- must rise if turnover (competition) rises

quit elasticity

- quit elasticity often used as measure of labor market competitiveness (Manning 2003)
  - logic: competitive labor market, can hardly deviate from prevailing wage
  - but consider what happens as $\lambda \to 0$
- here, elasticity is endogenous and often misleading indicator of competitiveness, worker well-being, efficiency,..
- no "neoclassical" mapping to
  1. allocative efficiency / underemployment
  2. distributional outcomes

non-competes: theory

some history

- Stigler (61,62) & McCall (1970): Study repeated sampling with dispersed prices/wages, characterize reservation values
- Diamond (1971): Can't sustain dispersed prices for homogeneous products/workers in equilibrium ("Diamond Paradox")
- Burdett & Mortensen (98): Can't sustain *any* mass in job offer distribution in a job ladder model.
  Why? Deviation, slightly above ⇒ Competition

adding non-competes to the model

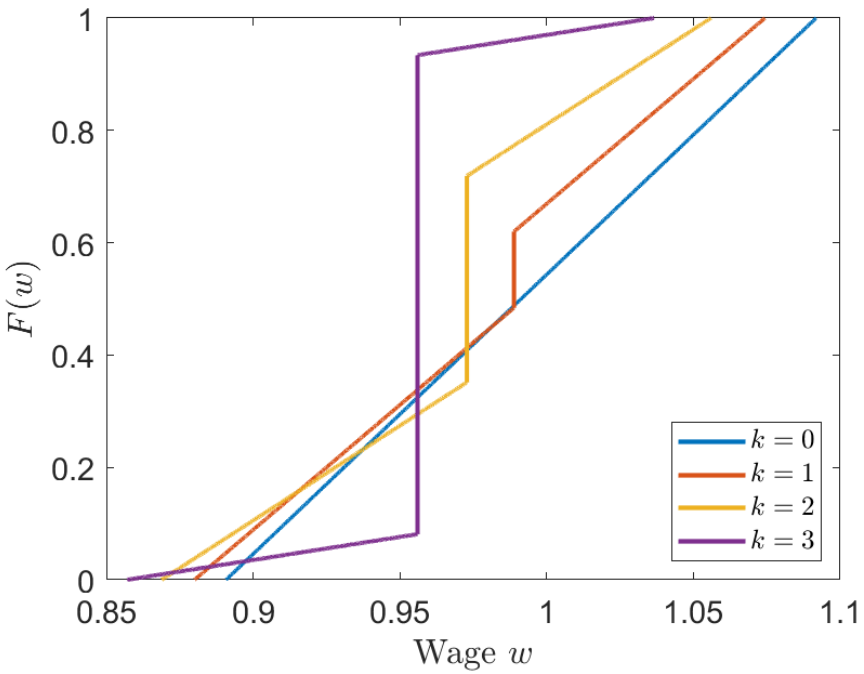
- model non-competes as take-it-or-leave-it offer that stipulates
  1. permanent wage offer w_c
  2. worker commits not to leave (job-to-job)

what do non-compete jobs offer to workers

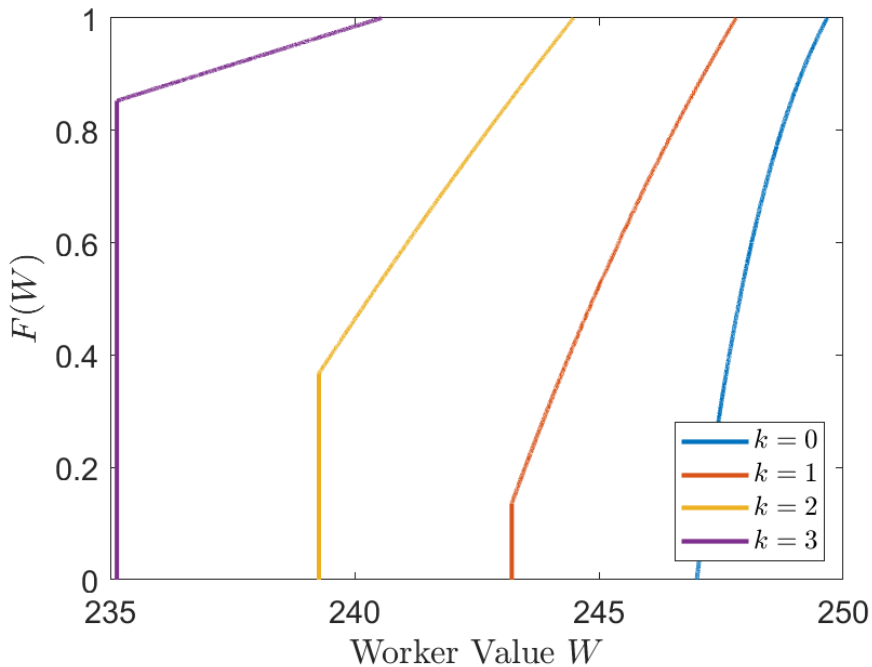
- key result: all non-competes give same *value* as regular job paying w_r
  - reason: no need to worry about competition
  - now have mass at the bottom rung of job ladder $\Rightarrow$ spillovers
  - firms that can offer non-competes all post w_c
  - generally, $w_c > w_r$ (same value, but lose option value, so compensating differential)
    - cross-firm wage differentials misleading re impact of non-competes

impact of non-competes

A. Wage offer distribution



B. Value offer distribution



Diamond restored

- when all firms can offer non-compete: $w_c = w_r = b$

  $\Rightarrow$ illustrates that non-competes, when wide-spread, can sharply depress wages by eroding job-ladder competition

non-competes — welfare

- two opposing forces re welfare
  1. show that firms w/ noncompetes have more employment, but same d.r.s. production function ⇒ misallocation
  2. however, competition here is wasteful
     - inefficient worker churn yields wage gains but socially costly
- a priori unclear whether a ban yields efficiency gains
  - numerically, get ban slightly reduces welfare
- caveat
  - misallocation (workers→firms) if job ladder improves allocation (here: doesn't), then additional costs of shutting it down

quantitative analysis of noncompetes

calibration strategy

- fairly standard job ladder model to calibrate (EU, EE, UE,..)
- set $\alpha = .64$
- target hiring cost $\frac{c}{E[w]}$ to 2 monthly wages.
- remainder: x_i, M, η set separate for each application.

quantitative strategy

- calibrate/validate via empirical studies

1. Prager & Schmitt (21) study hospital mergers
   - pick up response of wages and employment
   - comment: framework can straightforwardly be used for merger analysis

2. Lipsitz & Starr (20) study ban of noncompetes in Oregon
   - pick up response of wages, turnover, spillovers

main application: banning non-competes

- FTC: 20% of US workforce under non-compete, proposed blanket ban
  - many state level restrictions (recently, NY), lots of discussions in Europe
- surprisingly common for low-skilled workers (where posting seems natural and human capital and business stealing issues seem less relevant)
- surprisingly uniform across firm types

- baseline calibration: set $M = 10$ (symmetric) and $k = 2$, import η from Oregon experiment
- then focus on heterogeneity across markets

baseline results: banning non-competes

	Baseline
Share non-comp.	0.212
$\Delta \log(\mathrm{E}[w])$	0.04
Δu	1.198
$\Delta \log(\text{output})$	-0.008
Δ Utility	-0.009
$\Delta \log(\text{jtj})$	0.354
$\Delta \log(w_{nc})$	0.067
$\Delta \log(w_{rest})$	0.032

- large wage and mobility increases
- large spillovers
- employment and output slightly down due to rise in turnover cost (misallocation channel dominated)

training cost

	Baseline	c/E[w]=5
Share non-comp.	0.212	0.226
$\Delta \log(\text{E}[w])$	0.04	0.05
Δu	1.198	1.594
$\Delta \log(\text{output})$	−0.008	−0.01
Δ Utility	−0.009	−0.017
$\Delta \log(\text{jtj})$	0.354	0.349
$\Delta \log(w_{nc})$	0.067	0.118
$\Delta \log(w_{rest})$	0.032	0.03

- non-competes shifts rents
- more rents when training costs are high

demand elasticity

	Baseline	$\eta = 0.5$	$\eta = 5$
Share non-comp.	0.212	0.224	0.234
$\Delta \log(\mathrm{E}[w])$	0.04	0.019	0.001
Δu	1.198	1.592	1.965
$\Delta \log(\text{output})$	−0.008	−0.011	−0.013
Δ Utility	−0.009	−0.01	−0.01
$\Delta \log(\text{jtj})$	0.354	0.345	0.335
$\Delta \log(w_{nc})$	0.067	0.046	0.027
$\Delta \log(w_{rest})$	0.032	0.011	−0.007

- banning non-competes turnover cost
- if this cannot be (partially) passed into prices, gains to workers evaporate

coverage

	Baseline	k=5	k=c/E[w]=5
Share non-comp.	0.212	0.513	0.528
$\Delta \log(\mathrm{E}[w])$	0.04	0.113	0.168
Δu	1.198	3.208	4.602
$\Delta \log(\text{output})$	−0.008	−0.022	−0.032
Δ Utility	−0.009	−0.022	−0.039
$\Delta \log(\text{jtj})$	0.354	1.066	1.018
$\Delta \log(w_{nc})$	0.067	0.126	0.198
$\Delta \log(w_{rest})$	0.032	0.1	0.136

- logic: Diamond restored

heterogeneity

- conclude with a more full blown exercise
- firms differ in productivity and hiring cost
- study case where low productivity / high productivity firms use noncompetes

	Baseline	High	Low
Share non-comp.	0.212	0.186	0.207
$\Delta \log(\mathrm{E}[w])$	0.04	0.069	0.011
Δu	1.198	0.912	0.933
$\Delta \log(\text{output})$	−0.008	−0.007	−0.003
Δ Utility	−0.009	−0.008	−0.004
$\Delta \log(\text{jtj})$	0.354	0.261	0.297
$\Delta \log(w_{nc})$	0.067	0.092	−0.028
$\Delta \log(w_{rest})$	0.032	0.064	0.019

- logic: non-competes allow firms to move to the bottom of the job ladder

banning non-competes: quantitative lessons

1. wage gains of about 4%
2. large wage gains if 1) large frictions, 2) high coverage, 3) low product demand elasticity
3. typically welfare down, but small losses compared with wage gains
   $\Rightarrow$ can "protect" workers from this practice at low cost (?)

ongoing work on employer cartels

- use same framework to think about **wage-fixing** cartels
- main finding: outside competition determines harm and profitability.
- hence, wage losses large / cartels more likely when
  - market is concentrated
  - labor market has slack
  - the span of control is small
  - product demand is elastic
  - cartel also colludes in the product market

conclusion

- generalized job ladder framework (demand, production, size)
- natural labratory to think about anti-competitive practices centered around worker mobility
- large wage gains, small welfare losses from banning non-competes

Large firms in the labor market

Large firms can, in principle, affect

1. workers' actions (reservation)
   - assume that workers do not observe and do not learn firms' choices so that the reservation wage is taken as fixed
2. other firms' labor market actions (posted wages and contact rates)
   - assume that firms simultaneously commit at time 0 $\rightarrow$ firms take other firms' actions as given
3. how other firms choices (ψ_j, F_j) map to employment N_j
   - assume that firms also commit to employment and can hire at high cost from outsourcing firm outside the model

Back