# Joining the Gig Workforce: A (Potentially) One-Way Trip with An Expensive Return Ticket

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# Motivation

How does the gig sector affect workers and the labor market?

- Growing alternative work arrangement (e.g. Bracha and Burke, 2016)
- Worker outcomes are different from traditional sector (e.g. Jackson et al., 2017)
- Cyclicality with aggregate conditions in the labor market (e.g. Katz and Krueger, 2017)

Urgency: COVID accelerated the growth of gig sector, informal work arrangements more generally

# Literature

Our framework draws from theoretical work on search and match and empirical work on work arrangement and transitions:

- Search and match with heterogeneous agents and more than one sector: Wolcott (2021); Okolo (2021); Bosch and Maloney (2010); Albrecht and Vroman (2002), ...
- Gig sector, informal sector, alternative work arrangement: Katz and Krueger (2017); Bracha and Burke (2016); CIPD (2017); Gash (2008), ...

# Goals

Search and match model with:

- heterogeneous sectors, jobs, and workers
- endogenous sector choice
- frictions between sectors

Outcomes of interest:

- employment by sector
- wage heterogeneity
- gig choices, impacts on conventional sector
- impact on long-run measures, welfare

# Model Environment

- Two sectors: conventional, gig
- Firms in conventional sector:
  - post jobs (endogenous)
  - cannot target specific workers
- Gig sector divides work and revenue equally among all gig workers
- Four types of workers
  - Never-gig (1): only work conventional jobs
  - Maybe-gig (2): work both conventional jobs and/or gig work under certain conditions
  - Always-gig (1): always work in gig only, when available

# Model Environment 2

- Matches in conventional sector are one firm, one worker
  - On the job search for all gig workers without a conventional sector job
  - Firms cannot discriminate but do negotiate different wages once matched, based on productivity and gig employment status
- Workers can work conventional job only, gig job only, or both conventional and gig jobs
- Workers of different employment statuses have different options
- How do workers choose and what are the implications of their choices?

# Firms and Wages

Firms in the conventional sector follows the standard search and match model.

Jobs are filled by worker with gig-conventional employment status $i \in G, CG, C$:

$$J_{i,t} = y_{i,t} - k - w_{i,t} + \beta[(1-\delta_C)\frac{e_C}{e_{C,t+1} + e_{CG,t+1}}(J_{i,t+1} - V_{i,t+1}) +$$

$$(1\text{-}\delta_{CG})\frac{e_{CG}}{e_{C,t+1}+e_{CG,t+1}}(J_{i,t+1} - V_{i,t+1})]$$

Wages are a fraction of the match productivity, $\gamma$

$$w_{i,t} = \gamma y_i$$

# The Gig Sector

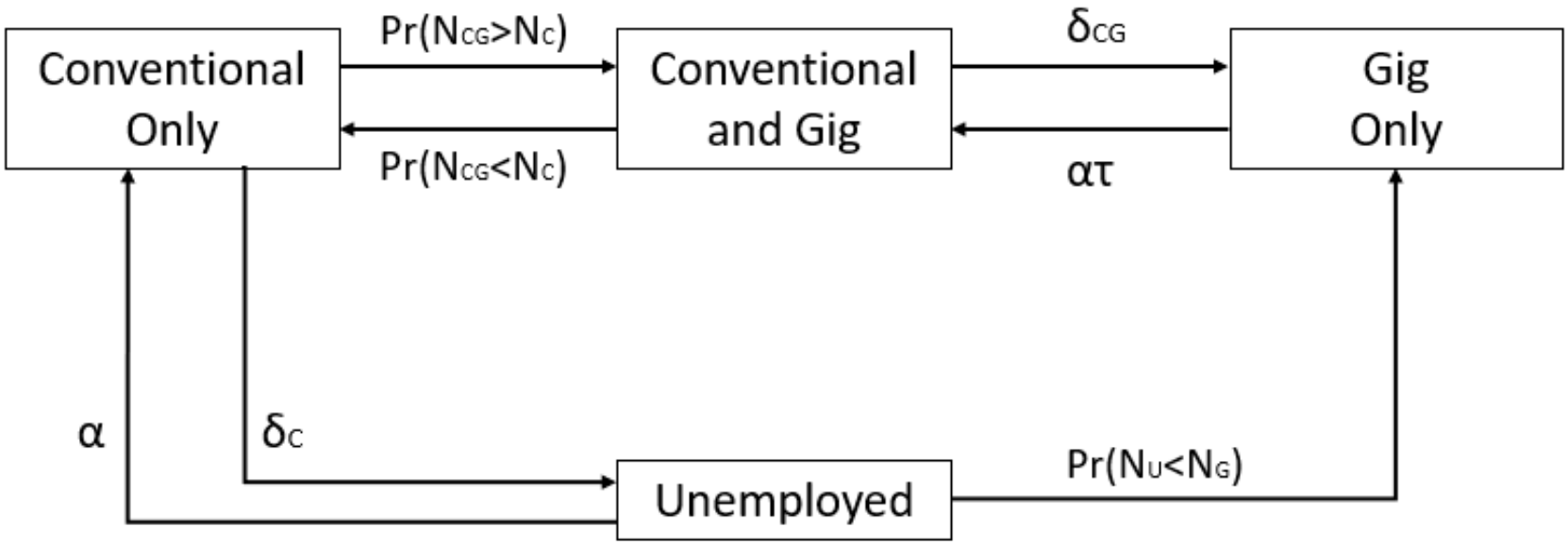
Wage depends on gig sector size, number of workers, surplus sharing:

$$w_G = \bar{G}/(e_G + e_{CG})$$

Cost of working in gig:

- Lower probability of matching in conventional sector
- Loss of unemployment benefit/leisure value

# Workers


Conventional Only
Pr(NCG>NC)
Pr(NCG<NC)
Conventional and Gig
δCG
ατ
Gig Only
α
δC
Unemployed
Pr(NU<NG)

# Worker Types

- determined by productivity draw
- cutoffs endogenous, depend on other parameters
- on the job search in conventional sector when doing gig-only work
- add gig work to conventional job when the combination yields higher value
  - wage in gig sector is endogenous, decreases as no. of workers increases
  - trade-offs of added income, but costly (matching, wage penalties)
- choose gig work over unemployment benefits when higher expected value
- types not perfectly correlated to employment status- matching frictions, exogenous job destruction
  - workers only have agency at transition points

# Worker Types

- Type 1 workers: standard search agents
  - $U \geq N_G, N_C \geq N_{C,G}$
- Type 2 workers: "sometimes gig v1"
  - $U < N_G, N_C \geq N_{C,G}$, or $N_C \geq N_{C,G} > N_G > U$
- Type 3 workers: "sometimes gig v2"
  - $U \geq N_G, N_C < N_{C,G}$, or $N_{C,G} > N_C > U \geq N_G$
- Type 4 workers: "always gig"
  - $U \leq N_G, N_C \leq N_{C,G}$

Worker Value Functions, Detail

# Steady State

- Wages: $w_C, w_{CG}, w_G, \bar{w}_C, \bar{w_{CG}}$
- Employment: $e_C, e_{CG}, e_G$
- Unemployment: $u$
- Market tightness: $\theta$
- Vacancies: $v$
- Distribution of Worker Types: 1-4
- Match probability: $\alpha_e$, $\alpha_w$

# What Can We Learn?

We are especially interested in:

- Employment outcomes across sectors
- Relative wage in the gig sector
- Difference in conventional sector due to addition of gig
- Distribution of worker types

Quantitative exercises:

- Insurance vs supplement channels (today)
- What happens if gig sector ($\bar{G}$) keeps growing?
- Welfare implications

# Parameterization: Benchmark Model

| Parameter | Definition | Value |
|---|---|---|
| $\beta$ | Discounting | 0.9967 |
| $\delta_C$ | Separation rate, conventional-only | 0.0262 |
| $k$ | Posting cost | 0.3 |
| $\phi$ | Matching efficiency | 0.18 |
| $b$ | Unemployment benefit | 0.5 |
| | Wage as ratio of productivity | 0.8 |
| Model-specific parameters, at benchmark | | |
| $g$ | Gig size (fraction) | 0.15 |
| $\delta_{CG}$ | Separation rate, conventional and gig | 0.04 |
| $\tau_m$ | Matching friction | 0.8 |
| $\tau_w$ | Wage penalty | 0.5 |

# Preliminary Results: Benchmark Steady State

| Outcome | Value |
|---|---|
| Type 1 worker | 55% |
| Type 2 worker | 0% |
| Type 3 worker | 6% |
| Type 4 worker | 39% |
| Conventional-only employment rate, $e_C$ | 0.55 |
| Gig-only employment rate, $e_G$ | 0.03 |
| Conventional and gig employment rate, $e_{CG}$ | 0.42 |
| Unemployment rate, $u$ | 0 |

# Preliminary Results: Comparative Statics

| Outcome | Benchmark | $\tau_m$ | | $\tau_w$ | | $b$ | | $g$ | |
|---|---|---|---|---|---|---|---|---|---|
| | | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| Type 1 worker | 55% | 100% | 55% | 67% | 0% | 45% | 49% | 100% | 2% |
| Type 2 worker | 0% | 0% | 0% | 8% | 0% | 16% | 0% | 0% | 0% |
| Type 3 worker | 6% | 0% | 0% | 0% | 29% | 0% | 21% | 0% | 0% |
| Type 4 worker | 39% | 0% | 45% | 25% | 71% | 39% | 30% | 0% | 98% |
| $e_C$ | 0.55 | 0.00 | 0.54 | 0.69 | 0.23 | 0.51 | 0.58 | 0.97 | 0.04 |
| $e_G$ | 0.03 | 1.00 | 0.01 | 0.00 | 0.01 | 0.03 | 0.01 | 0.00 | 0.02 |
| $e_{CG}$ | 0.42 | 0.00 | 0.45 | 0.30 | 0.76 | 0.47 | 0.41 | 0.02 | 0.94 |
| $u$ | 0 | 0.00 | 0.01 | 0.01 | 0.01 | 0.00 | 0.01 | 0.01 | 0.00 |

# Worker Types Space: Insurance Channel

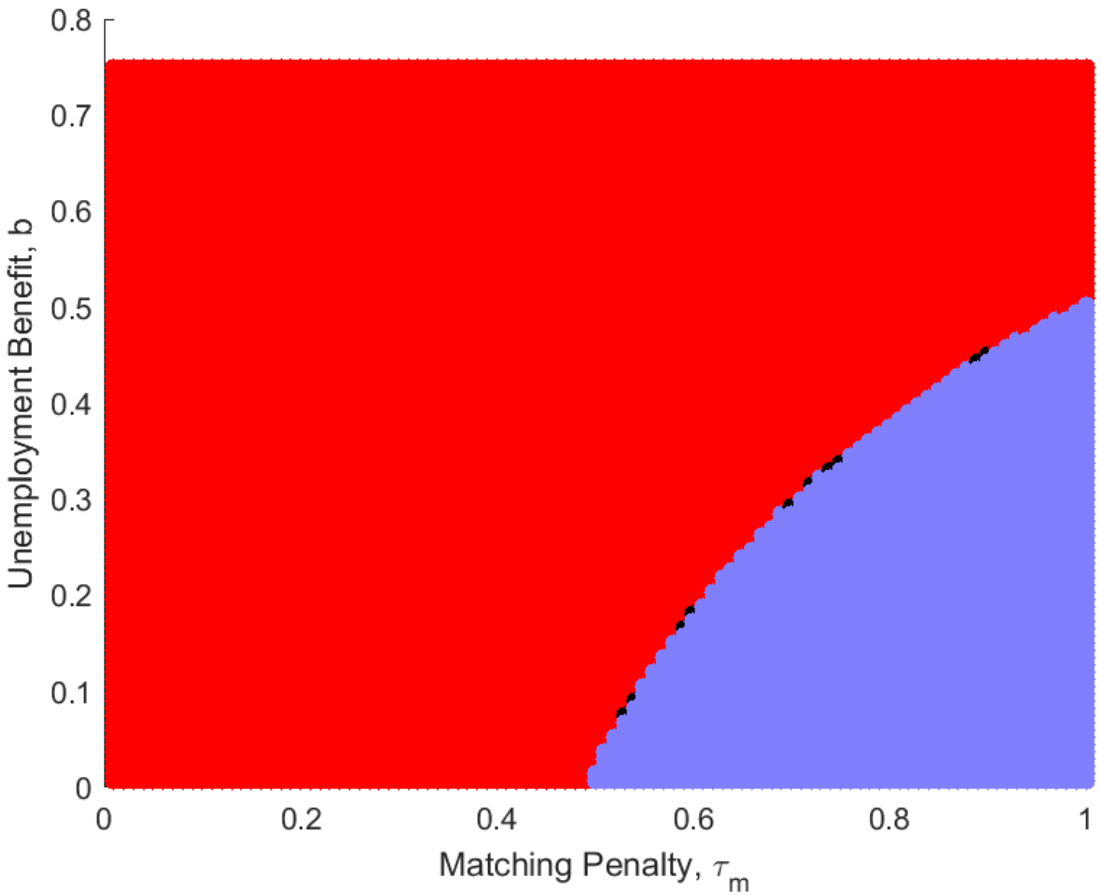



Figure: Interaction of $b$ and $\tau_m$

# Worker Types Space: Supplement Channel

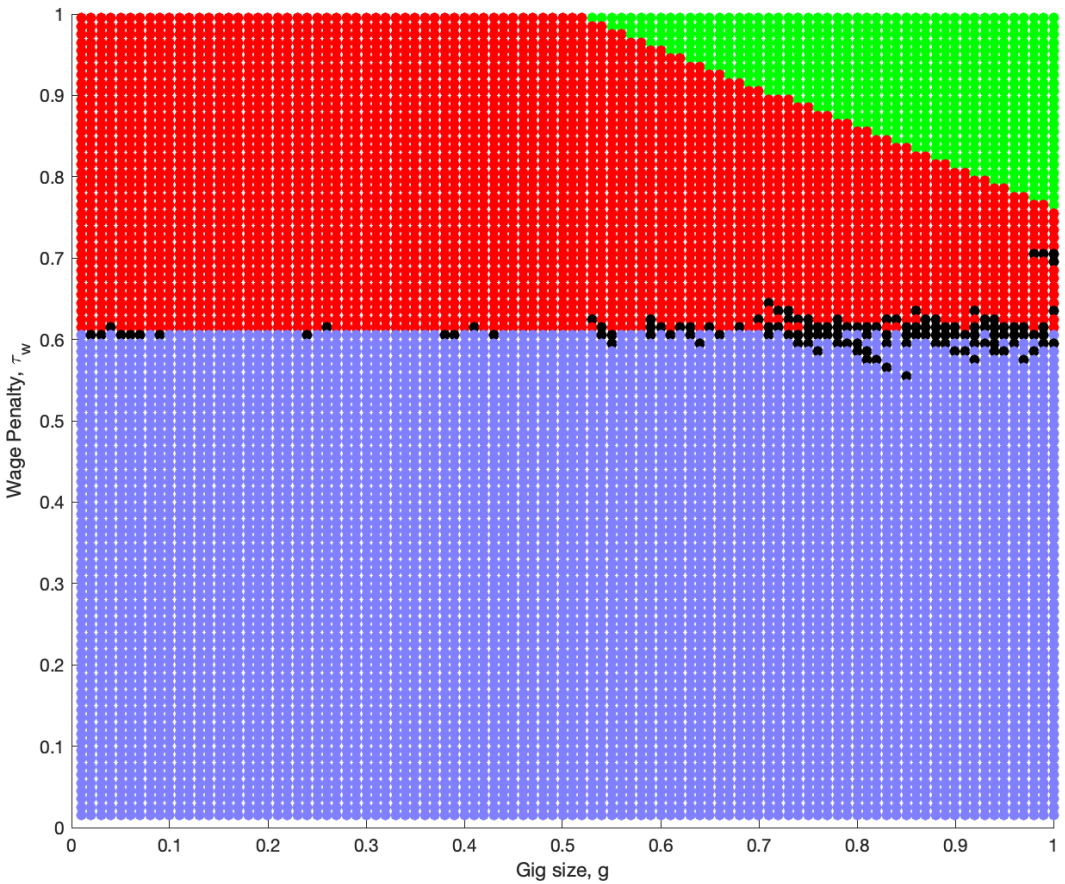



Figure: Interaction of $\tau_w$ and $g$

# Conclusion

- Gig is fundamentally different from the conventional sector:
  - hiring process
  - nature of work
  - wage process
- While gig provides options, it may come with costs
- Labor policy should take into account the role of gig work in potential to help and hurt workers

Next steps: welfare evaluation, policy experiments

Thank you!

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# Workers

When unemployed:

$$U_{i,t} = b_{i,t} + \beta[\alpha_{t+1} N_{c,t+1} + (1 - \alpha_{t+1}) max(U_{i,t+1}, N_{G,t+1})]$$

When employed:

$$N_{i,c,t} = w_{i,t} + \beta[(1 - \delta_C) max(N_{i,c,t+1}, N_{i,cg,t+1}) + \delta_C U_{i,t+1}]$$

$$N_{i,cg,t} = \tau_w w_{i,t} + w_{i,g,t} + \beta[(1 - \delta_{CG}) max(N_{i,cg,t+1}, N_{i,c,t+1}) + \delta_{CG} N_{G,t+1}]$$

$$N_{i,G,t} = w_{i,G,t} + \beta[\alpha_{t+1} \tau N_{i,cg,t+1} + (1 - \alpha_{t+1} \tau) N_{i,G,t+1}]$$

Back