

Minimum Earnings Regulation and the Stability of Marketplaces (Asadpour, Lobel and van Ryzin)

Work in the sharing economy is flexible but does not offer classical legal protections like minimum hourly wages.

In 2019, NYC implemented a minimum earnings regulation for ridesharing:

$$\text{minimum payment} = \frac{\$0.287 \cdot \text{minutes driven} + \$0.631 \cdot \text{miles driven}}{\text{company's utilization rate}},$$

with the utilization being remeasured every 6 months.

This law could potentially create a dynamic where wages and prices spiral out of control, an outcome we call **instability**.

- Under what conditions is such a marketplace stable?
- What are the implications for a market such NYC's?

The Model

- A platform sets prices p_t and wages w_t for each period.
- Demand is $D(p)$ and revenue is $R(p) \triangleq p \cdot D(p)$, with peak p^* .
- Supply is $S(z)$ and cost curve is $C(z) \triangleq z \cdot S(z)$.
- Supply and demand intersect at w^* : $D(w^*) = S(w^*)$.
- Supply is a function of earnings z , not wages w .
- $Q(p, z) \triangleq \min\{D(p), S(z)\}$: quantity of ride hours produced.
- $u(p, z) \triangleq Q(p, z)/S(z)$: driver utilization.
- $z = w \cdot u(p, z)$: **driver earning equilibrium condition**.
- The market is **M-minimum-earnings stable** if there exists a policy with nonnegative profits in almost all periods where

$$w_{t+1} \geq M/u(p_t, z_t).$$

Main Theorem

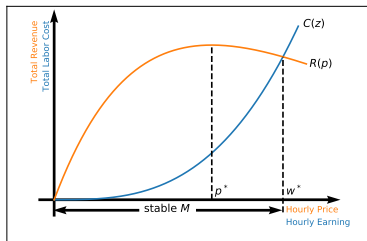
- Inverse cost function: $H(x) \triangleq C^{-1}(x)$

$$C(z) = z \cdot S(z)$$

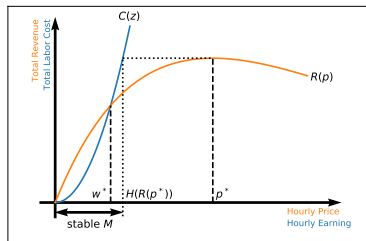
Theorem

An M -minimum-earnings marketplace is stable if and only if:

$$M \leq \begin{cases} w^* & \text{if } p^* \leq w^* \quad (\text{tight supply}) \\ H(R(p^*)) & \text{if } p^* > w^* \quad (\text{loose supply}) \end{cases}$$



Tight Labor Supply ($p^* < w^*$)



Loose Labor Supply ($p^* \geq w^*$)

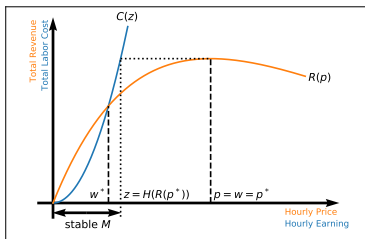
Calibration Results

We use elasticity estimates from the literature to calibrate our model.

With $w^* = \$22.79$ (and net earnings of \$14.25), demand elasticity = -0.6 , and supply elasticity = 4.8 :

- maximum gross earnings = $H(R(p^*)) = \$23.23$ (1.9% gain)
- maximum net earnings = \$14.69 (3.0% gain)

Why so little? Because supply is very elastic.



Ride-hailing providers are likely to remove free-entry from their marketplaces in order to maintain stability.