

Market Power, Innovation Flow and Macroeconomic Dynamics

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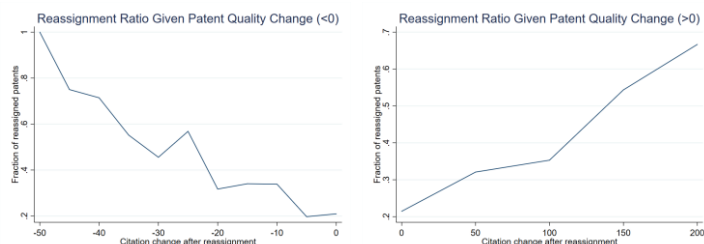
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Motivation and Introduction

- Motivation**
 - Innovation flow: firms trade in market for ideas/tech
 - Literature: patent market mitigates the misallocation of ideas
- This paper**
 - How and to what extent do innovation buyers affect patent market efficiency and aggregate growth
 - Contribution: effect of market power on R&D incentive, inter-firm innovation reassignment, and aggregate welfare
- Empirical**
 - Patents get more productive on average after being transferred
 - Some tech transfers are unproductive due to market power of technology buyers
- Theoretical**
 - GE model with heterogenous firms and innovation transfer
 - Quantify net effect of market power and buyer complementarity
- Key mechanism**
 - As firms expand and accumulate market power, they make more unproductive tech acquisitions, leading to distorted incentives for startup innovation and slowing down productivity growth

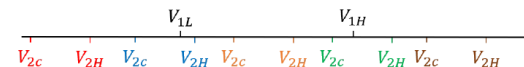
Empirics

- Data: patent grant, citation and reassignment from USPTO
- Patents receive more citations after transferred (1.48 vs 0.88)
- Reassignment generates extreme patent quality



Model

- Set-up**
 - HH log preference; final good is Cobb-Douglas composite
 - Intermediate firms linear production $y_{fi} = q_{fi} l_{fi}$
 - Bertrand competition: markup $\mu_i \equiv \frac{p_{fi}}{w/q_{fi}} = \frac{q_{fi}}{q_{-fi}} = \lambda^{\Delta_i}$
 - Incumbents acquire technologies to eliminate competition (internal) or expand (external)
 - Startups innovate to compete with or sell tech to incumbents
 - Innovations, market power and productivity**
- | Innovation type | Productivity | Arrival rate | R&D cost | Markup (λ^Δ) |
|---------------------------|-------------------------|--------------|----------------------------|---------------------------------|
| Startup incremental | $q' = \lambda q$ | z_{dj} | φz_{dj}^2 | $\Delta \rightarrow \Delta + 1$ |
| Startup radical (compete) | $q' = \lambda' q$ | z_c | $\tilde{\varphi} z_c^2$ | $\Delta \rightarrow r$ |
| Startup radical (sell) | $q' = \lambda'^{m_j} q$ | z_{ej} | $\tilde{\varphi} z_{ej}^2$ | $\Delta \rightarrow r + m_j$ |
- Firm heterogeneity type $j \in \{H, L\}$: $m_H > m_L$
 - Incremental (radical) innovation increases market power (productivity) by more
 - Startup Innovation choice**
 - Incumbent and startup bargain to split the trading surplus
 - Value function for a startup
 - e.g. incremental+internal $rV_{1j} - \dot{V}_{1j} = z_{dj} [\mathbb{E}_\Delta(P_{dj}(\Delta)) - V_{1j}] - \varphi z_{dj}^2 w$.
 - Similar for radical (compete V_{2c} , external V_{2j})
 - Depending on the type of defensive & expansionary type-k, a startup chooses R&D and trading partner by comparing VF

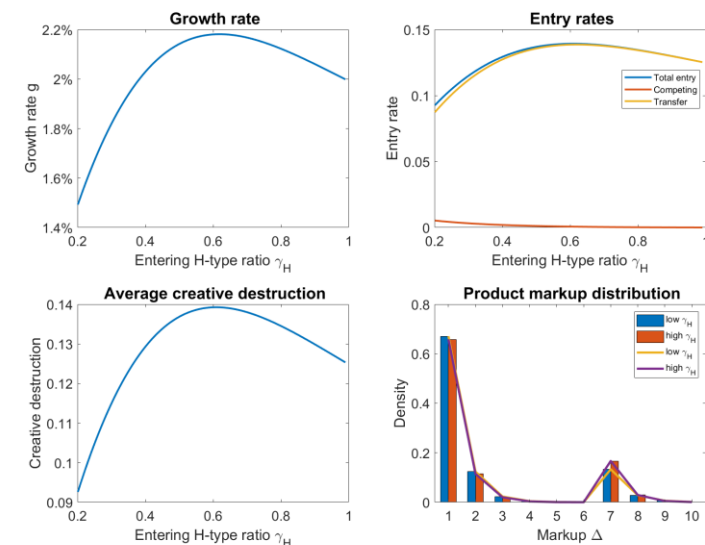


Conclusion

- Document cross-sectional patterns in patent market.
- Develop a GE model capturing tradeoff of market power and productivity and quantify the macro impact of tech market.
- Large incumbents slow down productivity due to market power.

Quantification and Analysis

- Comparison of balanced growth path
 - When competing, a startup becomes a H-type firm w.p. γ_H .
 - As γ_H increases, aggregate productivity growth, startup entry rate and average creative destruction first increase because of more productive tech acquisitions due to high m_H .
 - As γ_H passes a level, H-type firms dominate most industries and accumulate high market power. They make internal acquisitions that pay generously to startups making incremental innovations. Productivity slows down due to lack of radical innovation.
 - Product markup becomes more dispersed - more misallocation



Main Reference

- Akcigit, U., Celik, M. A., Greenwood, J. (2016). Buy, keep, or sell: Economic growth and the market for ideas. *Econometrica*, 84(3), 943-984.
- Peters, M. (2020). Heterogeneous markups, growth, and endogenous misallocation. *Econometrica*, 88(5), 2037-2073.