Buy, Keep, or Sell: Economic Growth and the Market for Ideas

Akcigit, Celik, & Greenwood (2016)

Levi Crews (Chicago)

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Heterogeneous firms + Heterogeneous ideas = Potential misallocation

- Firms, ideas differentiated by **technology class** $\implies$ class-X ideas best-suited for class-X firms
- if not, no mismatch $\implies$ no resale (except maybe trolls)
- but there is a **secondary market** for patents:
  - **20%** of all domestic patents (1976–2006 USPTO) are traded from one firm to another
  - not even accounting for M&A, licensing, within-firm transfers, sales by individuals
  - lots of **frictions**: adverse selection (lemons), search (no centralized marketplace)
- **question:** how **big** and how **important** is the misallocation from mismatch?
- **today:** review of facts & model with comments interspersed

What gets sold on the secondary market?

Tech. classes X, Y (IPC codes):

$$d(X,Y) = 1 - \frac{\overbrace{\#(X \cap Y)}^{\text{patents citing } X,Y \text{ simul.}}}{\underbrace{\#(X \cup Y)}_{\text{patents citing } X \text{ and/or } Y}}$$

Patent p, firm f:

$$d_\iota(p,f) = \left[\frac{1}{|\mathcal{P}_f|} \sum_{p' \in \mathcal{P}_f} d(X_p, Y_{p'})^\iota \right]^{1/\iota}$$

with $0 < \iota \leq 1$

A patent p ...

1. contributes more to firm f's **stock market value** the **lower** is $d(p,f)$;
2. is more likely to be **sold** the **higher** is $d(p,f)$;
3. is, on average, sold to a buyer b for which $d(p,b) < d(p,f)$.

Suggests secondary market helps reallocate patents to better users

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Model in a picture: Propinquity + Buy/Keep/Sell

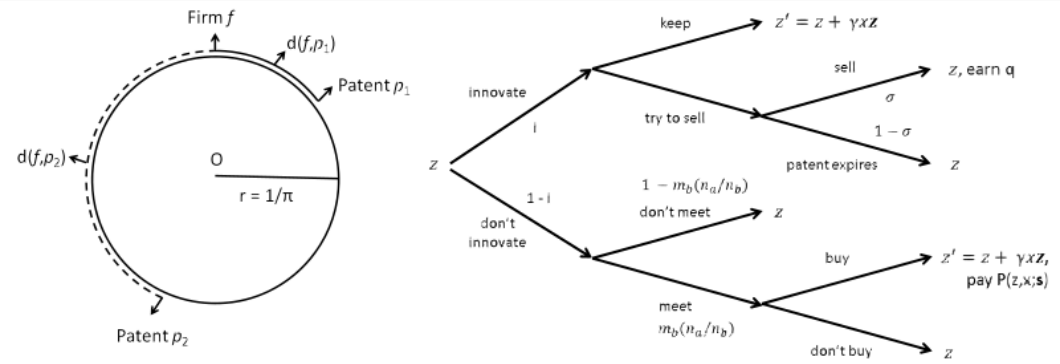

FIGURE 2.—The technology circle (left panel) and the timing of events (right panel) for d-type ideas. Note that n-type ideas arrive after the market for d-type patents closes.

An inventory of inefficiencies

1. **knowledge spillovers**:

$$z' = z + \gamma_d x\mathbf{z} + \gamma_n b\mathbf{z}$$

   almost always in our models
2. **undirected innovation**: innovation yields patent of random propinquity
3. **undirected search**: meet a patent agent holding a patent of random propinquity
4. **non-unit contact rate**: may not meet a patent agent at all

What if we could eliminate (2)–(4)?

What **else** could we have considered?

- **adverse selection**: ideas differentiated by **quality**, not just propinquity
- **financial frictions**: need capital to pay up front for patent

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How important is the misallocation of ideas?

TABLE VI

THOUGHT EXPERIMENTS[a]

	BM	PDS	PDSwHC	PI
Output growth rate, %, $(\mathbf{g}^{\zeta/(\zeta+\lambda)} - 1) \times 100$	2.08	2.19	3.05	3.38
Innovation rate, **i**	0.58	0.56	0.57	0.61
Welfare gain, $\alpha - 1$	0.00	0.02	0.14	0.18
Fraction of all patents sold	0.17	0.20	0.68	0
Growth from all patents sold	0.19	0.27	0.73	0

[a]The first column of results is for the baseline model (BM). Perfectly directly search (PDS) is shown in the second column where a patent sold is a perfect match for the buyer ($x = 1$). In the third column (PDSwHC), there is perfectly directed search, plus there is a high contact rate between patent agents and buyers. All innovating firms draw the perfect idea ($x = 1$) in the last column (PI). The figures in the first row (only) are in percent.

How big is the misallocation of ideas?

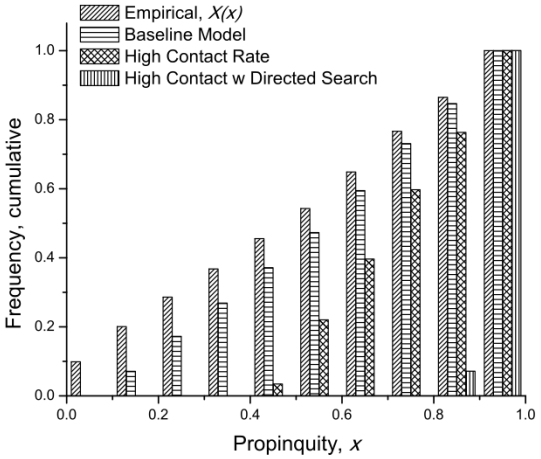

FIGURE 7.—Misallocation of ideas. The graph plots the cumulative distribution functions for x. A higher value for x, measuring propinquity, implies that an idea is better suited for a firm.