

Stylized facts and related literature

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1 Introduction

In this document, I first outline the stylized facts that have emerged from the empirical literature on the aggregate distribution of firms characteristics, microeconomic firm dynamics (entry, exit, investment in R&D, other forms of investment), industry evolution and non-compete contracts. Next, I discuss the existing models in the literature that have been written to explain these facts. Finally, I argue why the novel ingredients in my model (1) help the model to explain these facts; and, more importantly, (2) make the model a better guide to the effects of non-compete enforcement on spinout entrepreneurship and productivity growth than existing models or than simply extrapolating in a model-free way from the existing empirical estimates.

2 Stylized facts

2.1 Joint distribution of firm size, productivity, R&D expenditure, wages

1. Luttmer 2007: Firm size distribution (measured by employment) is well-approximated by Pareto distribution with tail index $\zeta = 1.06$

2.2 Dynamics of productivity growth: creative destruction, spinouts, entry, exit, imitation, etc.

1. Gibrat's law: firm growth rate conditional on survival is independent of size. Some caveats from Dunne-Roberts-Samuelson (Sutton 1997). Conditional on survival,
 - Large firms grow more slowly than small firms, but are less likely to exit

- Old firms grow more slowly than young firms, but are less likely to exit

2. Muendler-Rauch-Tocoian 2012, Brazil.

- employee spinouts account for between 1/6 and 1/3 of new firms
- employee spinouts are larger than unrelated firms at entry. director/manager spinouts 85% larger; five-or-more-employee spinouts are 12% larger
- employee spinouts 5-yr failure rate is 8.5 pp lower than for unrelated firms
- employee spinouts 5-yr absorption rate is 2.5 p.p. higher than for unrelated firms (and 28% of absorbed spinouts are absorbed by their parents)
- spinouts take on 23% of employees of incumbent with them on average

Exit

1. Luttmer 2007, SBA data 1988-2006: exit rate is 10.4% / yr for < 20 employees, 2.5% / yr for > 500 employees.

2.3 Use of non-compete contracts

2.4 Effects of non-compete enforcement or non-compete contracts

On worker mobility

1. Fallick et al. REStat 2006: employer-employer mobility rates are 40% higher in Silicon Valley computer cluster than in computer clusters in non-enforcing states.¹
2. Balasubramaniam et al 2017, "Locked in? The enforceability of CNCs and the careers of high-tech workers": going from median to maximum enforcement increases mean job spell length by 8 pp
3. Marx 2009: Enforcement leads to less frequent job switching (mean job spell length increases by 8 pp); the effect is stronger for workers with firm-specific skills or who specialize in narrow technical occupation

¹Uses CPS data. An important caveat: in regressions that control for a Silicon Valley effect in addition to a California effect (on the rate of changing jobs within industry, which is what non-competes are relevant for), the California effect is no longer statistically significant! The two effects are jointly significant at the 1% level, but the Silicon Valley has both a larger t-statistic and a substantially larger magnitude. In my reading, this is evidence that there is something special about Silicon Valley relative to the rest of California's computer industry. None of these industries have non-competes. At best, we can simply say that the data are consistent with the *possibility* that non-competes can lead to more mobility, but you still need to get lucky for it to happen, explaining why not all of California has more mobility, but the *only* cluster which experiences this increased mobility is located in California. A bit of a stretch.

On wages

1. Balasubramaniam et al. 2017: going from median to maximum enforcement reduces wages of high tech workers by 3 pp more than non-high tech workers
2. Starr 2017, "Consider this: training wages and the enforceability of CNCs": increase from non-enforcement to mean enforcement leads to a 14% increase in training, but a 4% decrease in hourly wages. Decrease in hourly wages driven by thinner right tail of wage distribution

On investment (by incumbents or employees), spinouts and entrepreneurship

1. Jeffers JMP 2018, "The impact of restricting labor mobility on corporate investment and entrepreneurship": finds that varying non-compete enforcement generates a trade-off of **\$2 million of additional capital investment from publicly-held firms for every lost new firm entry**.²
2. Starr-Balasubramaniam-Sakakibara MSci 2018, "Screening Spinouts...": In US data (LEHD): standard deviation increase in enforceability is associated with
 - (a) 0.13 p.p. decrease in mean WSO entry rate
 - (b) 1.1% increase in initial size of WSOs (measured by employment). Breaking down size increase, impact is 1.5% on the 25th percentile of size distribution but only 0.4% on 75th percentile of size distribution
 - (c) Note: I have issues with this paper, see "Outline of model 3-9-2018"
3. ibid: higher enforceability associated with higher earnings of founders pre WSO
4. Samila-Sorenson 2011: Non-enforcing regions exhibit a larger response of entrepreneurship, patenting, employment, and income to exogenous increases in the supply of VC funding
5. Marx 2015: Enforcement leads to brain drain of inventors / knowledge workers towards non-enforcing regions; the effect is stronger for higher-impact, smore collaborative workers (Marx 2015).
6. Starr 2017, "Consider this...": enforcement does not decrease self-sponsored employee training

²Gets exogenous variation in non-compete enforcement from rulings by state supreme court judges; observes employee occupation better than usual bc has LinkedIn data; controls for firm and industry-time fixed effects.

On knowledge spillovers

1. Matray JMP 2014, "The local spillovers of listed firms": finds that **non-compete enforcement halves the degree of local knowledge spillovers**.³

Effects of "Due consideration" statutes

1. Starr 2017, "Consider this...": negative wage effects of enforceability driven by consideration laws. If consideration beyond continued employment is required, enforcement does not lower wages.
2. Starr-Bishara-Prescott, "Non-competes in the US labor force"
 - 20% of employees have non-competes
 - 40% have signed one in the past
 - More likely in high-skill, high-paying jobs, but also surprisingly common in low-skill, low-paying jobs
 - less than 10% of employees negotiate over noncompetes
 - 1/3 of non-competes are signed after accepting job offer, 2/3 of job applicants had no alternative job opportunities when they were asked to agree to a noncompete
 - People who have alternative employment options, and are presented the noncompete before accepting the offer, earn 19% higher wages, receive 14% more training, and are 13% more satisfied in their job than those not bound by noncompetes
 - Those asked to sign after accepting an offer are 15% less satisfied and experience no wage and training benefits
 - Bizarrely, non-competes are as frequently included in contracts when they are unenforceable in the state of employment...
 - ...and have the same effects even in unenforceable states

3 Related models

Spinouts, entrepreneurship and growth

- Rossi-Hansberg & Chatterjee IER 2012, "Spinoffs and the market for ideas"

³Uses clever instrument the generates exogenous variation in the innovation intensity of some firms in a region, then looks at the effect on other firms using a diff-in-diff.

- Franco & Filson RAND 2006, "Spin-outs: knowledge diffusion through employee mobility"
- Klepper & Sleeper Management Science 2005, "Entry by Spinoffs"
- Golman & Klepper RAND 2016, "Spinoffs and clustering"
- Klepper AER 1996, "Entry, Exit, Growth and Innovation over the Product Life Cycle"

Firm dynamics (entry, exit, size distribution), innovation and aggregate productivity growth

- Acemoglu & Cao JET 2015, "Innovation by entrants and incumbents"
- Akcigit & Kerr JPE 2017, "Growth through heterogeneous innovations"
- Grossman & Helpman REStud 1991, "Quality ladders in the Theory of Growth"
- Aghion & Howitt ECTA 1992, "A model of growth through creative destruction"
- Luttmer QJE 2007, "Selection, growth and the size distribution of firms"
- Luttmer JET 2011, "Technology diffusion and growth"⁴

Non-competes

- Shi JMP 2017, "Restrictions on Executive Mobility and Reallocation - The Aggregate Effect of Non-Competition Contracts"
- Franco & Mitchell JEcmgmtStrat 2008, "Covenants not to compete, labor mobility, and industry dynamics"
- Rauch 2015, "Dynastic entrepreneurship, entry and non-compete enforcement": borrowing constraints prevent ex-post renegotiation of non-compete contracts, enforcement is suboptimal
- Shankar Ghosh,
- Starr, Balasubramaniam & Sakakibara MSci 2018, "Screening spinouts"

⁴Expands on the variety of knowledge spillover processes analyzed, discusses when and how they lead to Pareto's distribution / Zipf's law