Notes for Meeting 8-11-2017

August 11, 2017

Non-competes, spinoffs and innovation / growth

- **Observations:**
  1. Non-competes very common among senior executives (70.2%, Garmaise 2011), electrical engineers (50%, Marx 2011), and *especially* common among companies receiving investments from VC firms (90%, Kaplan & Stroemberg 2003).
  2. non-competes solve a hold-up problem but also can reduce the dissemination of knowledge, reallocation of workers to better-matched firms, and reduce competition (even if there is no knowledge spillover).
  3. non-competes are heavily enforced in some states (e.g., MA, TX) but very weakly enforced in other states (e.g., CA).
- **Question:** What is the effect of non-competes on growth, business / labor-market dynamism, and welfare? What is the optimal non-compete enforcement policy?
  - **Growth and welfare:** pretty clear reason why this matters.
  - **Labor market dynamism:** Would be interesting to see what the prediction of the model is for labor-market dynamism and see if that helps to explain the decline documented in e.g. Hyattt & Spletzer IZA 2013. However, as they document, the decline in hires and separations has been driven largely by a decline in "short-term jobs", and is largest in recessions. Not sure how this squares with the secular increase in the usage of non-competes.
  - Also, as pointed out in Ghosh et. al. 2016, firms will enter into informal "non-poaching" agreements with other firms in the absence of non-compete enforcement. This implies: (1) we have to be careful about how we model the "no enforcement" regime; (2) since this practice appears to be somewhat common in Silicon Valley, even ignoring brain drain, the fact that
- Answer: need a **general equilibrium model** of endogenous growth through R&D, with knowledge spillovers over to R&D employees. Especially in light of Marx et. al. 2015 "Brain drain", it's plausible that

enforcing non-competes in a particular region leads to underperformance largely due to brain drain, i.e. the effect of not enforcing non-competes in certain regions is to depress national output, but also shift it to regions where non-competes are not enforced.

  - Model based on Akcigit & Kerr 2017, which is based on Klette & Kortum 2004.
  - So far modeling ONE aspect of this - people leaving to form competing startups. Still, works in the same direction - the more ppl you employ in R&D, the more competition you will have. This lowers the investment in R&D, because you want to prevent this spillover of knowledge.
  - Many others that could be added in principle, each with their own parameters to identify. This is the simplest, I think.

- Want to use model to evaluate:

  1. Vary enforcement of non-competes and see impact on growth.
     (a) For now: all employees bound by non-compete of expected length T_c. Comparative statics on T_c.
     (b) Eventually: endogenize the decision to write a non-compete (and the length) depending on other parameters.
     (c) Missing: competition. This is all about effects on knowledge spillovers, not effects on market structure per se. C.f. Kang & Fleming, 2017 "Large firm advantage and entrepreneurial disadvantage: non-competes and market concentration."
  2. (Eventually) Can the model explain brain drain from areas with enforcement to areas with no enforcement?
     - From Marx et. al. 2015, "Brain drain": Workers routinely take actions to avoid the potential consequences of non-compete infringement, as was illustrated by an engineer in the internet-search industry we happened to come in contact with. Previously based in New York, he had worked at another internet-search firm when an attractive offer arrived from a competitor with a nearby office. When his former employer verbally threatened him with legal action (though no suit was formally brought) the new employer changed his job offer from its New York office to its California office. "That non-compete," said the engineer in a thick Brooklyn accent, "is the only reason I'm working in California today."

- Data:

  1. Will want to use employer-employee matched data, coded closely by industry, with the names of the founders, to compute the rate of spinouts (ν) and the rate at which ideas enter the public domain (θ). Not

really sure how I will get identification on this second parameter, but maybe solving the model will give me ideas.

- Existing theoretical work on effect of non-compete enforcement on growth and welfare.
  - Franco & Filson 2006
    - No role for non-competes.
  - Franco & Mitchell 2008, "Covenants not to compete, labor mobility, and industry dynamics"
    - Close to my proposed future work because they study enforcing vs. non-enforcing regions, but two-period model so doesn't capture all dynamic effects on the BGP.
    - Unobservable learning by workers creates need for non-compete. Optimal contract stipulates that worker has the option to "buy out" the non-compete.
    - But, also, they do not allow firms to pay below-market wages in the first period, by assuming inability of firms to commit or something like that. This would allow firms to sort of "replicate" non-compete agreements even in non-enforcing regions.
    - Result: early on enforcing regions have an advantage, but eventually non-enforcing regions do.
  - Ghosh & Shankar 2016, "Optimal enforcement of noncompete covenants"
    - Discussed below.
  - Rauch 2015, "Dynastic entrepreneurship, entry, and non-compete enforcement" +
    - Closest to my model in that it is a stationary model of long-term growth, but super ad-hoc and partial equilibrium.
    - Focuses entirely on the effect of non-compete enforcement on entry decisions and considers financing constraints. Without financing constraints, non-compete enforcement is optimal because workers can simply buy out their non-competes when they have an idea that improves the joint surplus. With financing constraints, non-compete enforcement can be suboptimal because
    - Extremely complicated ad-hoc model that is hard to read and very partial equilibrium. Unsatisfying.
    - For example, they do not model the labor market explicitly. Hence, they are simply *shutting off* in an ad-hoc way the mechanism for efficiency w/o non-competes in Franco & Filson 2006. They justify this decision informally by citing one of the reasons I describe below.
    - Moreover, because they do not model the labor market explicitly, they can't really claim to show that it is *enforcement* of non-competes that is bad, but rather *forcement*, if you will, of non-competes (also a shortcoming of my model right now, though).

    - The fundamental economic mechanism at work here is not "bilaterally optimal employment arrangements can be socially suboptimal" or anything like that.
    - Instead, it is more a story of: what is the optimal allocation of property rights to different agents in the economy, given financial frictions and contracting frictions – and noting that you are really shifting property rights from agents at different points in their life-cycle? Well, since the employees are the ones having the ideas in this economy, and given the contracting frictions, the only way to get the ideas to *happen* is
  - Klepper & Sleeper, "Entry by Spinoffs"
    - Focus is not on non-competes and their effect on spinoffs and growth, but rather on the question of which firms spawn spinoffs.

- Challenges:

  1. **Solving the actual model** is hard. Because workers earn human capital from working in R&D, and the value of this human capital depends on the quality and market structure (i.e. # of current competitors) of that product, their wage will be discounted for more profitable R&D projects. But this breaks the "linear in q" nature of the model, which is one of the aspects that makes these endogenous growth models w/ quality ladders tractable. So, to solve the model, I will need to explicitly represent the state, (q, m), both of which are unbounded, and q takes discrete jumps...It's quite challenging, and I can't really think of a way around it. Besides brute force, my main idea is to make R&D workers not have the choice of which firm to work at. This is quite strange, I agree, but it would have the effect of making the wage they receive simply scale with the productivity of the economy, and then everything would scale with q if we made a suitable change to the R&D technology of incumbents.
  2. **Efficiency of equilibrium:** Equilibrium wihtout non-competes appears to be inefficient, which means my model can't generate a need for non-competes.
     (a) In Franco & Filson 2006, without non-competes the equilibrium is efficient. This is because workers compensate employers for the leaked knowledge by accepting lower wages in equilibrium: the classic "knowledge spillover" externality in endogenous growth models disappears when these spillovers only take place within the context of a competitive employment arrangement. I believe this result holds in my model as-is, so that the equilibrium would be Pareto efficient (at least along this dimension - if anything this implies that the equilibrium will in general have *too much growth* since we are only left with the creative destruction externality.
     (b) There are two fundamental reasons for this result, as I understand it:

i. The (subjective) joint surplus from defection is weakly larger than the joint surplus from cooperation.

ii. Investment (by firms and/or workers) and learning (by workers) is observable.

(c) If either of these assumptions do not hold, the equilibrium without the option for non-competes is inefficient.

i. If what the employee gains from defecting is smaller than what the firm loses, then non-competes will be involved in the optimal contract. If moreover this wedge exists forever (meaning, the value to the worker of using the knowledge in any future period is smaller than the loss to the incumbent from that knowledge being used in that future period) this (bilaterally) optimal contract will involve a *permanent* non-compete.[1] And in either case, without such a contract, there will be a socially suboptimal level of investment by the firm (however this might be compensated by increased employee mobility, more on that below). This follows immediately by comparing the value to the employee of two alternative contracts offered by the firm which make the firm indifferent, one of which involving a non-compete. The worker essentially will be unwilling to fully compensate the firm, since he does not see all of these benefits.

ii. The Franco & Filson result depends on the worker paying for the part of the investment that the firm undertakes that benefits him. This only works if this amount of investment is specified in the employment contract. If this cannot be specified legally, and if reputational concerns cannot allow for commitment to honor investment promises, then the optimal contract may make use of restrictions on employee mobility.

(d) I am most interested in breaking this equivalence through (1) for now. Variety of ways to do this:

i. Financial frictions (making it more costly for spinoffs to enter).

ii. Adjustment costs (makes it more costly to build a business, more costly to liquidate, so works on both sides of the equation by making the cost to the incumbent greater and the benefit to the defector smaller).

[1] This is difficult to break in my model, as well, because I am only focusing on employees leaving to *start* firms. If employees were leaving to work, then, intuitively, eventually losing the idea wouldn't cost much to the incumbent (since profits will have been competed away anyway), but would be worth something to the employee who can use it productively (by being employed by a different employer, potentially in a different industry). So this causes non-competes to be less than infinite in practice. But in my model, it seems like this would not occur: if the effect of defection in period t is to reduce the joint surplus between the different *firms* with that knowledge, then it will always be this way in periods $t' > t$. Think about this a bit more.

iii. Risk aversion by employees. Idiosyncratic risk (who will start the startup? them or their coworkers) not perceived by the firm generates this wedge.

iv. Private information about the quality of the knowledge that will be spilled over.

   A. Application of logic in Rossi-Hansberg & Chatterjee, "Spin-offs and the market for ideas": hiring someone without a non-compete is analogous to selling an idea. With private information all ideas must sell at the same price, hence there is adverse selection and the market unravels unless we "force" some firms to sell their ideas. Interestingly, one way to accomplish this is by *not enforcing non-competes*. This forces all ideas to be sold at the pooling price, reviving the market for ideas (and knowledge spill overs). If, at the investment stage, the quality of the discovered knowledge is not known, then with risk-neutrality this will not be a problem. However, if firms know which investments will be more productive, then the fact that they are forced to sell at a pooling price means that the most productive investments will receive too little investment. Essentially, we will have pushed the adverse selection problem earlier into the production process: instead of agents with high quality ideas not bringing them to market, agents with the potential to develop those ideas simply do not develop them in the first place.

v. Similarly, as pointed out in Rauch 2015, private information on the part of the employee.