Unemployment and Market Size

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Search Frictions and Aggregate Dynamics

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Summary

- Paper characterizes dynamics in a random matching model with non-constant returns to scale (and stochastic initial match productivity):

$$M = \Phi(m(u, v))$$

with

$$\eta \equiv \frac{m\Phi'(m)}{\Phi(m)};\ \eta_u = (1-\alpha)\eta;\ \eta_v = \alpha\eta$$

- This setup generates locally increasing (decreasing) returns in matching when $\eta > (<)0$. With $\eta = 1$, we are back in DMP.

Contributions

The authors develop a tractable model with non-constant returns and rich dynamics. Specifically,

- **Multiplicity** The model may generate multiple Pareto-rankable steady-state equilibria;
- **Saddle-Point Stability** is shown to require decreasing returns to vacancy creation ($\alpha\eta(m^*) < 1$);
- **Market Size Effects** Around a steady-state eq. with decreasing returns to scale θ, λ and z vary negatively with u;
- **Generalized Hosios Rule** With decreasing (increasing) returns, the constrained efficient allocation can be decentralized with the help of taxes (subsidies) so that $\beta_1 = (1-\alpha)\eta$ and $\beta_2 = \alpha\eta$;

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But in my view the authors are too agnostic about the source of non-constant returns in matching.

Outline

- **History:** aggregate dynamics with increasing returns in matching
  - Multiple equilibria and coordination failures
  - Indeterminacy
  - Strategic complementarities
- **Microfoundations for (non)constant returns in matching**
- **Calibration issues**
- **Policy**

Multiple equilibria and coordination failures

The early search literature devoted quite some attention to the analysis of increasing returns in matching and the possibility of coordination failures and equilibria with suboptimally high unemployment levels.

- Diamond's (1982) coconut story

In the words of Weitzman (1982), increasing returns lead to violations of Say's Law. Other implications:

- Dynamics may feature limit cycles.
- Temporary policy measures may have permanent effects.

However, this literature focuses on insufficiency of aggregate demand. Moreover, no two-sided matching.

Indeterminacy

More recent research has demonstrated that increasing returns in matching may generate indeterminacy in standard two-sided matching models.

- The same necessary condition: increasing returns to vacancy creation (Giammarioli, 2003);
- Nonetheless, indeterminacy and saddle-path stability are mutually exclusive features — two vs. one negative roots;
- Sun-spot cycles may occur without real shocks;

In the paper at hand indeterminacy also seems possible. If so, it either should be discussed or ruled out explicitly.

Strategic complementarities

In the mid-90's interest in increasing returns and strategic externalities resurfaced.

- Complementary pre-market investments (Acemoglu, 1996)
- Complementary search effort (Laing, Palivos and Ping Wang, 1995)

In recent years, the DMP setting with CRS has become the workhorse model. In quantitative exercises it is a way to bind ones hands (e.g. "unemployment volatility puzzle").

Moreover, constant returns in matching seems a plausible assumption and has solid microfoundations for large markets.

Microfoundations for trading frictions

Explicit models of trading frictions may feature "thin-market externalites" for small-scale markets but they typically feature CRS as the market grows big.

- Urn-ball matching technology: $m = v(1 - e^{-u/v})$
- The cab model of Lagos: $m = min(u, \phi v)$
- Telephone line model of Stevens: $m = p(z)\frac{\alpha u \gamma v}{\alpha u + \gamma v}$

A notable exception:

- Information transmission through social networks (Calvo-Armengol & Jackson, 2004)

Sources of non-constant returns in matching

The model exercise would gain in interest, and the same is true for the policy analysis as the calibration exercise, if the authors would be more specific about the sources of the non-constant returns to scale.

- Pure spillovers;
- Complementary search effort;
- Congestion or slow information transmission in large markets;

This may help to rule out unlikely patterns of non-constant returns and once we know the determinants (i) it may be easier to predict in which region the economy will settle (ii) to design specific policies to correct the .

Pure spillover effects

Giammarioli (2003) considered the following reduced form:

$$M = AV^a U^b \text{ with } a + b = 1$$
$$A = \bar{V}^{(\alpha - a)} \bar{U}^{(\beta - b)} \text{ with } \alpha \geq a, \beta \geq b$$

In symmetric equilibrium $V = \bar{V}$ and $U = \bar{U}$ and

$$M = V^\alpha U^\beta$$

Here agents take aggregate labor market conditions as given and only consider local labor market conditions. Ill-suited for decreasing returns. Spillovers may be asymmetric, but still a black box.

Strategic complementary in search effort

- Complementary search effort is my preferred option. A standard specification in which

$$M = \tilde{m}[(s^w u), (s^f v)]$$

and $\tilde{m}$ is homogenous of degree one in effective search units does not yield non-constant returns (Pissarides, 2000). But other specifications may.

- In addition, when $M = \Phi(\tilde{m})$, the individual search decisions interact with the non-constant returns to scale in line with the extension in earlier versions.

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- In addition, when $M = \Phi(\tilde{m})$, the individual search decisions interact with the non-constant returns to scale in line with the extension in earlier versions.
- **Bottom line:** Do the authors have a story in mind? If so, than they should spell it out. A reference to inconclusive empirical evidence is not entirely satisfactory (poor quality of vacancy data / problems in the proper delineation of markets).

Calibration

The authors convincingly demonstrate the existence of market size effects and the lower speed of convergence with decreasing returns to scale in matching.

But there are serious issues when we want to calibrate the model to data:

- What are "plausible values" for η? Does the empirical literature provide guidance?
- How relevant are market size effects in the data? Can we properly identify them?
- Slow convergence and possibly even market size effects could possibly arise endogenously. Can we distinguish the local dynamics with decreasing returns from a model with adjustment costs in vacancy creation? Disregard of effect of on-the-job search on dynamics.
- How to proceed if there are multiple equilibria?

Contrasting impulse response functions

The argument in favor of locally decreasing returns to scale and market size effects would be stronger if the authors

- document the importance of market size effects
- compare simulated and estimated impulse response functions.
- demonstrate that their model "outperforms" the standard matching model along relevant margins and that the same pattern cannot be generated by reasonable extensions of the standard model.
- in the latter case we could even do without a comprehensive explanation for the non-constant returns.

So far, however, the changes seem limited to the slower convergence and the effects seem modest in size.

Policy

Another option is to elaborate more on the role of public policy in the presence of non-constant returns to scale.

- The authors formalize the existence of an adjusted Hosios' rule. But this is a local result and the use of taxes may be inappropriate with multiple equilibria.
- There is no participation margin but it seems the government might have incentives to take some agents temporarily out of the market after a negative shock. This contrasts radically with actual policy.
- More generally, once the source of decreasing returns is known, there may be scope for policies that improve the working of the matching process itself.

Concluding remarks

- An interesting paper that sheds a novel light on dynamics in matching markets
- The numerical results are supportive, but the model has too many degrees of freedom to be taken to the data. An alternative may be to explore the policy implications more in detail.
- In my view the paper would gain in quality if some more structure is imposed on the pattern of returns to scale.