Contracts and on-the-job search ☆

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Abstract

The paper studies a matching model with on-the-job search, transferable utility and heterogeneous agents. Matched agents can set the conditions under which a given match can be dissolved. It is shown that matched agents use sign-off fees to extract all capital gains from trade when a third agent is contacted. In equilibrium, this redistributes wealth towards less able individuals, reduces the likelihood that any given match will be rejected and, given the conditions, it yields efficiency. Although externalities arise when a match is formed and when turnover occurs, the decentralized outcome is efficient when the production function is sub-modular and the difference in abilities is big enough. The results obtained may provide theoretical support for the type of contracts used in some markets, such as sports markets.
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The objective of this paper is to study the equilibrium outcome in a matching model with on-the-job search, transferable utility and ex ante heterogeneous agents. Matched agents decide the conditions under which a given match can be dissolved. As an example, consider two types of agents, *hs* and *ls*, where *hs* have higher ability than *ls*. The productivity of a match is a function of the ability of the agents involved. Because utility is transferable, both agents in a match will be interested in maximizing total match payoff. Assume an *h* and an *l* form a match (an *hl* match) knowing that the *h* can contact a single *h* in the future, and they decide to allow a turnover (a break-up of their own match and the formation of an *hh* match) if the contact occurs. It is shown in detail that they set a sign-off fee (payable to the *l* left single) that drives the capital gain of the *hh* match to zero. That is, they use a sign-off fee to extract all gains from the turnover. Under

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which conditions will they actually allow the turnover? It is shown in detail that they do only if the total capital gain created by the turnover is positive. The total capital gain is made up of three elements: the capital *loss* of the *l* left single, the capital gain of the *h* in the *hl* match moving into the *hh* match, and the capital gain of the single *h* moving into the *hh* match. The model allows for an additional means to transfer utility: side payments payable at the beginning of the relationship, or sign-on fees. The value of sign-on fees is decided using Nash bargaining. Therefore, it takes into account the conditions for match dissolution established by the agents. In the example above (assuming the surplus of the turnover is positive), it takes into account the value of the sign-off fee and the likelihood that the *h* contacts a single *h*. More generally, similar decisions must be made for each possible contact that can occur in a match. The main findings are: *a*) The payoff to any given match that is expected to separate in the future (after a turnover) increases, because they appropriate the capital gains created after a turnover. This increases the likelihood that matches are formed when two single agents meet (decreasing the likelihood of obtaining assortative matching) and therefore decreases the levels of inactivity. *b*) Even though all decisions taken by agents (regarding matching and turnover) create externalities, the decentralized outcome is efficient if the production function is sub-modular and the difference in abilities is big enough. *c*) Low ability types are more able to take advantage of the opportunities to extract capital gains from turnovers, so utility is redistributed in their favour. Hence, allowing for endogenous sign-off fees could, simultaneously, redistribute wealth towards less able agents, yield efficiency and decrease unemployment (inactivity). Some markets are characterized by this type of contracts, in particular, sports markets. The results obtained can provide theoretical support for the use of these contracts in such markets.[1] Indeed, it is popularly accepted that the transfer system in the football market provides a way of keeping smaller teams afloat and producing new players.

Each feature in the model has been addressed in the literature, but never have all been used in the same model. Their combination is what leads to the above results. It is, for example, the combination of on-the-job search and transferable utility which allows agents to use sign-off fees to maximize the payoff to their relationship. Diamond and Maskin (1979) analyze a matching model which also combines these two assumptions. But the model here differs crucially form theirs. While this model analyzes ex ante agent heterogeneity, theirs addresses ex post match heterogeneity with homogenous agents. Apart from the expected differences regarding matching and turnover behavior, this allows to address the effects on agents of different types. Burdett and Coles (2000) analyze a similar model, as they allow for ex ante heterogeneity and on-the-job search. Nevertheless, utility is not transferable in their setup. Lu and McAfee (1996) analyze a model with ex ante heterogeneity and bargaining, but they do not allow for on-the-job search. In Lu and McAfee, two agents who trade leave the market immediately. Here, two agents who trade form a continuing productive relationship, during which each agent continues to contact other agents. Further, in Lu and McAfee, new agents join the market each period in order to maintain the distribution of unmatched agents intact. Hence, they assume away an interesting complication when agents are heterogeneous. Namely, that the agents' strategies affect the relevant distribution of agents in the market. The model presented here explicitly considers the consequences of agents' decisions on the relevant distributions. Shimer and Smith (2000) investigate a matching model with frictions. They address long term relationships, but do not study on-the-job search. This allows to ignore the possibility of endogenous quits, because they study a stationary

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[1] For example, on April 4, 2004, ESPN announced in its website that the English football club Aston Villa agreed with striker Milan Baros a buy-out clause of £18 million. The Spanish football club Barcelona and its playmaker Deco have agreed on a buy-out clause of €75 million.