Effect of labor market policies on unemployment when firms adapt their recruitment strategy

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ABSTRACT

Firms conduct interviews to select who to hire. Their recruitment strategies affect not only the hiring rate but also job destruction rate as more interviews increase the chances of finding the right worker for the job; a link mostly overlooked in the literature. I model this recruitment behavior and investigate the effects of labor market policies on unemployment. These policies change the value of hiring the right worker, altering firms' incentives to conduct interviews. Policies further affect job creation and destruction when firms adapt their recruitment strategies. Net effect of a policy on unemployment depends on the magnitude of change in job creation versus destruction. Qualitative analysis reveals that the effect of a policy on unemployment is mostly weakened with the introduction of firms' recruitment behavior to the model. Firing taxes still increase unemployment, albeit at a lower rate. The effect of hiring subsidies on unemployment is even reversed: Unemployment increases with hiring subsidies if firms adapt. Minimum wage and unemployment insurance policies are also analyzed.

1. Introduction

The importance of a search for information in the labor market has been widely recognized, starting from the seminal work of Stigler (1962). Empirical studies cited below document that firms exert effort to assess the suitability of candidates before the hiring decision. Labor market policies can alter firms' incentives to put effort into finding the best candidate among applicants. Hence, ignoring firms' selection effort while evaluating the effects of policies on the unemployment rate may be misleading. This paper develops a model of hiring behavior of firms and investigates the unemployment rate response to firing taxes, hiring subsidies, minimum wage and unemployment insurance policies in the presence of such channel.

Search by firms is centered around the selection of the best candidate among applicants of a vacancy. van Ours and Ridder (1993) use data from the Netherlands and find that vacancies are mostly filled among applicants that apply for the job shortly after the vacancy is opened, but that hiring takes place long after the application process. Similarly, van Ours and Ridder (1993), Barron et al. (1985), Barron and Bishop (1985) and Barron et al. (1997) find that employers put effort into assessing the suitability of applicants to select the best candidate. Moreover, as firms search more thoroughly for a better candidate the cost they incur increases (Barron and Bishop, 1985). Thus, search by an employer affects not only the arrival rate of an

employee but also the compatibility of the new hire for that job as well as the vacancy cost. A better suited match will be more productive and last longer. However, in a standard search model à la Pissarides (2000), the intensity of a search by an employer only affects the arrival rate of a candidate.[1]

To formally analyze the selection efforts of firms, I employ a discrete time infinite horizon search and matching model in which workers and firms are homogeneous and there is a match specific quality: The quality of an employment relationship between a firm and a worker (match) can be good or bad. Good matches generate a positive surplus while bad matches do not, and hence are not desirable. A vacant firm and an unemployed worker decide whether to form the employment relationship with limited information regarding the quality of the match, which is acquired as explained below. The quality is completely revealed after parties observe the output. Employment relationships which are inferred to be bad are terminated in equilibrium.

When a firm posts a vacancy, it picks the number of workers to conduct interviews with, incurring some cost. An interview is a draw from a distribution and the value drawn is the probability of the quality of the match between the firm and the worker being good. At the end of the interviews, the firm selects the worker with whom it has the highest probability of having a good match.[2] If the selected worker is available for hire, as she may not be if she chooses some other firm she

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interviewed with, the firm and the selected worker decide whether to form the employment relationship based on this probability. Even though this probability is the highest among possibly multiple interview outcomes, it may not be high enough to convince the parties to start the employment relationship. Hence, the model has a threshold probability below which hiring does not take place. If the probability is above the threshold (if the chances of the match quality being good are high enough), then the firm and the worker form the employment relationship. When the production takes place, match quality is learned observing the output.

Since a firm interviews possibly a multiple number of workers and picks the one with the highest probability, firms' search behaviors determine the equilibrium distribution of the probability of new hires being good matches. This distribution governs the fraction of formed employment relationships that are good. Consequently, it affects the average productivity in the economy as well as the job durations. Firms choose the number of interviews to maximize the value of their vacancies. A firm's choice of interviews depends on the surplus good matches can generate, the cost of the interviews, and the distribution that probabilities are drawn from at the interviews.

Unemployment in this model is determined by the inflows from and outflows to employment. Inflow rates are due to exogenous idiosyncratic destruction shocks to matches and separation decisions of firm–worker pairs who learn that their match is bad. Outflows result from hirings. Hiring occurs if the worker who is the firm's best option is available for hire and the probability of their match quality being good is high enough. The number of interviews in the economy affects unemployment through changing these inflow and outflow rates. These rates are directly affected by the selection decisions of firms and indirectly affected through the general equilibrium effects on the number of vacancies in the economy as well as the threshold value. All else equal, the inflow rate depends negatively on the selection as more interviews reduce the fraction of new employment relationships that have bad quality, therefore reducing separations into unemployment. As more interviews increase the chances of an acceptable match, the direct effect of selection on outflows is positive.

In the presence of firms' selection efforts, any labor market policy can potentially alter the incentives to interview, generating an extra channel through which policies affect the unemployment rate. I calibrate the model to match US labor market moments and use this model to analyze the unemployment rate response to firing taxes, hiring subsidies, minimum wage and unemployment insurance policies and the contribution of the selection effort channel to such response. Firing taxes are known to increase unemployment as they discourage firms to open vacancies, thereby reducing the job finding rate. In an economy with selection effort, implementing a firing tax increases firms' incentives to conduct interviews. Incentives arise because good matches become more valuable as they save firms from paying the firing tax. As more interviews increase the chances of a good match thereby reducing separations, we observe less increase in the unemployment rate as a response to a firing tax than we would have observed in a counterfactual economy without selection (without adjustment in the number of interviews). The mitigating effect of the selection on unemployment increases with the firing tax. Adjustment through the selection choices of firms also mitigates welfare losses associated with the firing tax policy.

With a hiring subsidy in place, hiring the wrong worker becomes relatively less costly, reducing firms' incentives to invest in selection. A decline in the number of interviews increases bad matches in the economy, thus increasing separations. Moreover, there is more hiring (vacancies) in equilibrium as not only the hiring subsidy, but also the decline in the total vacancy cost due to less interviews increases job creation. In the calibrated model, for low values of subsidy, the effect of increasing the job finding rate dominates (as the policy is not large enough to change firms' selection decisions), and the unemployment rate falls. As the hiring subsidy increases, the effect of increasing

separations dominates and the unemployment rate goes up. Welfare loss moves in the same direction as unemployment. In contrast, in an economy with no selection, the hiring subsidy monotonically reduces unemployment and increases welfare.

The paper also looks at the implications of minimum wage and unemployment insurance policies. The equilibrium effects of a minimum wage policy are qualitatively the same as those of a firing tax policy. The number of interviews increases with minimum wage while the unemployment flow rates decrease and unemployment increases. Unemployment insurance directly affects only the outside option of a worker. Hence, there is no direct effect of unemployment insurance on a selection decision. Moreover, the quantitative analysis reveals that general equilibrium effects are not strong enough to change firms' selection decisions, given the calibrated parameters. Firms choose not to change their number of interviews for plausible values of an unemployment insurance policy. Nonetheless, unemployment increases with unemployment insurance.

This paper is related to the recent literature that models firm selection. Villena-Roldán (2012) develops a model of firms' recruitment behavior to explain the negative duration dependence of unemployment and re-employment wages. Firms interview applicants, who are heterogeneous in their innate productivity, and observe their productivity. They hire the most productive workers, generating an endogenous positive relationship between unemployment exit rate and productivity, and hence wages. Wolthoff (2014) develops a directed search model with worker-specific productivity in which firms decide on the number of interviews they conduct. He characterizes the equilibrium and looks at its implications over the business cycle.[3] Tasci (2006) models firms' recruitment choices as deciding between two different screening technologies with one being more costly and more effective (i.e., delivering matches with higher expected probability of good quality) than the other. He shows that firms change their choices of technology as a response to productivity shocks and this behavior can explain some of the volatility of the key labor market indicators over the business cycle.[4]

Other studies analyze economic environments where there are multiple job applications. Blanchard and Diamond (1994) aim to understand how the composition of unemployment affects wages if firms hire the worker with the least amount of unemployment duration among multiple job applicants. They find that wage dynamics in a model with ranking changes significantly compared to a model with random hiring. Moen (1999) argues that one aspect of the returns to investment in human capital is its effect on the probability of being unemployed. As firms will hire workers with the highest productivity, workers with higher human capital are more likely to be hired in the presence of multiple job applicants. Similarly, Gavrel (2012) uses an urn-ball model where firms select among multiple job applicants. Employing such a model with worker heterogeneity, he investigates the efficiency of the equilibrium. Albrecht et al. (2006) analyze the equilibrium of a directed search model with multiple applicants and random selection, in which there can be competition among vacancies to hire the same worker.[5] In all these models, firms' selections (applicant ranking) affect the hiring and (in some) the job productivity in a fashion similar to this paper. Different from these studies with multiple job applicants, separations also depend on firms' hiring actions in this paper.

This work is also related to papers that study labor market policies.

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[3] Also, Merkl and van Rens (2012) develop a model with ex ante heterogeneous workers in their training costs. In the model firms hire workers with training costs below some threshold value. They argue that with such selective hiring, welfare costs of unemployment are larger.

[4] In a model with a similar worker selection, Chugh and Merkl (2015) characterize efficient allocations and business cycle fluctuations. Also see Gautier (2002) for a study of externalities in the presence of non-sequential search.

[5] Also see Albrecht et al. (2003).