

## 1: Incentives in competitive search equilibrium

*Our equilibrium concept is the competitive search equilibrium. One of its core elements is that it postulates a unique relationship between the attractiveness of the offered wage contract and the expected rate at which the vacancy is filled.*

Advanced Search Abstract This paper proposes a labour market model with job search frictions where workers have private information on match quality and effort. Firms use wage contracts to motivate workers. In addition, wages are also used to attract employees. We define and characterize competitive search equilibrium in this context, and show that it satisfies a simple modified Hosios rule. We also analyse the interplay between macroeconomic variables and optimal wage contracts. Finally, we show that private information may increase the responsiveness of the unemployment rate to changes in the aggregate productivity level and, in particular, to changes in the information structure. In this literature, firms are typically modelled in a parsimonious way, with exogenous output per worker. In particular, agency problems between workers and firms are ignored. The focus is thus solely on the effects of search frictions on the flows into and out of employment. The firm observes total output but cannot disentangle output into its different components. The firm acts as a principal and chooses a wage contract that maximizes profits given the information constraints. Without search frictions, a firm, when setting the wage contract, trades off incentives for the worker to provide effort and rent extraction from the worker. This trade-off is also present when there are search frictions in the labour market. However, with search frictions, rents that accrue to the worker have an additional effect. More rents to the worker when hired also benefit the firm in the recruiting process, as it speeds up the hiring rate. Hence, it is less costly for a firm to provide workers with incentives when it operates in a competitive, frictional market than in a frictionless market. We show that the resulting search equilibrium, which we refer to as generalized competitive search GCS equilibrium, has a simple form. The agency problem and the wage-posting problem can be disentangled into two separate maximization problems. When the information constraints are tight in a well-defined sense, the optimal wage contract prescribes that a large share of the match surplus is allocated to the employees. As a result, profits will be lower and fewer resources are used to create new vacancies as compared to the equilibrium without agency problems. We also show that macroeconomic variables influence the tightness of the information constraints and hence the optimal contracts. We then analyse the effect of private information on the responsiveness of the unemployment rate to productivity changes, motivated by findings in Shimer and Hall. They document that fluctuations in the unemployment rate predicted by the standard Diamond-Mortensen-Pissarides DMP model Diamond, ; Pissarides, ; Mortensen, in response to observed productivity shocks are much smaller than actual fluctuations in the unemployment rate, as wages in the model absorb much of the shock. First, we analyse the effects of negative productivity changes where all firms are hit equally hard pure productivity shocks. Therefore, the unemployment rate becomes more responsive to such shocks than in the standard search model. Our numerical analysis indicates that the responsiveness of the unemployment rate to pure output shifts is close to this upper limit. We also analyse the effects of changes in the dispersion in the match-specific productivity term. This has a large effect on the unemployment rate and a small effect on output. A combination of changes in productivity and dispersion may give rise to an elasticity of the unemployment rate to observed output per worker consistent with the empirical findings. In a related model, Faig and Jerez analyse a retail market with search frictions when buyers have private information about their willingness to pay. Although their paper studies private information in a competitive search environment, their model and its emphasis differ from ours. Faig and Jerez focus on welfare analysis and abstract from moral hazard problems. They do not derive the modified Hosios condition, nor do they analyse the impact of macroeconomic variables on sharing rules and incentives. Guerrieri studies the welfare effects of including non-pecuniary aspects of a match that are private information to workers. She finds that the resulting allocation is inefficient out of steady state. Our paper belongs to a small subset of this literature that focuses on private information. In his paper, firms have more private information about the productivity of the match. Workers and firms bargain over wages, and the bargaining game is set-up in such a way that the increase in average productivity associated with a boom is allocated to the firm. This dramatically

increases unemployment volatility. Although asymmetric information is the driving force in both models, the mechanisms are very different. In our model, private information leads to agency problems within the firm and thus lower output. The firms respond to this by advertising higher expected wages as this reduces the agency problems. As a result, relatively small inefficiencies in the worker-firm relationship may lead to a large increase in the unemployment rate. Menzio also studies bargaining between workers and firms with private information, and shows that firms may find it optimal to keep wages fixed if hit by high-frequency shocks. Guerrieri studies a competitive search model where workers have private information about non-pecuniary aspects of a match. Private information only plays a role at the hiring margin. She finds, in calibrations, that this amendment to the standard search model does not help to amplify unemployment volatility. Our model is also related to the literature on efficiency wage models e. Weiss, ; Shapiro and Stiglitz, Some of these papers examine the comparative static properties of efficiency wage models Danthine and Donaldson, ; Strand, ; MacLeod, Malcomson and Gomme, ; Ramey and Watson, ; MacLeod and Malcomson, In a static model, Rocheteau introduces shirking in a search model and shows that the non-shirking constraint forms a lower bound on wages. The paper is organized as follows: Section 2 presents the model. In Section 3, we study the full-information benchmark. In Section 4, we introduce and characterize the GCS equilibrium. Section 5 contains the quantitative analysis. Section 6 offers final comments. Unless otherwise stated all proofs are relegated to the appendix. The economy consists of a continuum of ex ante identical workers and firms. All agents are risk neutral and have the same discount factor  $r$ . Workers live forever and the measure of workers is normalized to one. Let  $u$  denote the unemployment rate and  $v$  the vacancy rate in the economy. Firms are free to open vacancies at no cost, but maintaining a vacancy entails a flow cost  $c$ . The number of matches per unit of time is determined by a concave, constant return to scale matching function  $x(u, v)$ . Let  $p$  denote the matching rate of workers, showing the rate at which unemployed workers meet a vacancy. Let  $q$  denote the matching rate of firms, showing the rate at which firms with a vacancy meet an unemployed worker. Our model brings two new elements into the standard DMP model, both common in other parts of labour economics. First, we assume that the output of a match depends on worker effort,  $e$ . Second, we include stochastic job matching Jovanovic, ; Pissarides, , Chapter 6 , i. We further assume that  $H$  has an increasing hazard rate. Note that although there are two variables the firm cannot observe, the information problem facing the firm is one-dimensional since the firm observes the sum of the two variables. Firms advertise wage contracts and can commit not to renegotiate the contract. We do not consider tenure-dependent contracts. Below we show that the optimal contract, allowing for time dependence, is indeed tenure-independent. If workers are ex ante heterogeneous, and worker type is contractible, different worker types would search in different submarkets. Then  $U$  is defined as where  $s$  is the exogenous separation rate. The utility flow when employed is equal to the wage less the effort cost and less the expected capital loss associated with losing the job. The expected discounted value of a worker being matched is thus  $U$ . The expected discounted utility of an unemployed worker is given by  $z$  where  $z$  is the utility flow when unemployed. Assuming that an abandoned firm has no value,  $V$  is given by Let  $V$  denote the expected discounted value of a firm with a vacancy. The expected value  $J$  to a firm of being matched is thus  $J$ . The value of a vacancy can be written as  $V$ . For our subsequent analysis, it is convenient to use the concept of worker rents associated with a match. The expected worker rents of a match can be expressed as  $R$ . Using the definition of worker rents, the expected utility of an unemployed worker takes a particularly simple form  $z$ . That is, the flow value of an unemployed worker is equal to the utility flow when unemployed plus the expected gain from search, which is equal to the matching rate times the expected rent associated with a match. Thus, we have  $z = U + pR$ . This will serve as a benchmark for later analysis. Our equilibrium concept is the competitive search equilibrium Moen, One of its core elements is that it postulates a unique relationship between the attractiveness of the offered wage contract and the expected rate at which the vacancy is filled. This relationship can be derived in several alternative settings. Although the contracts advertised by firms may be complex, the relevant variable for an unemployed worker is the expected value of being matched. The more attractive contract a firm offers, the more workers will be attracted to that firm. Generically, let  $U_e$  denote the equilibrium utility of a searching worker. For any value of the expected rent  $R$  a firm offers, the queue length of workers adjusts so that the applicants obtain their

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equilibrium expected utility. In equilibrium, firms choose wage contracts so as to maximize profits. In addition, free entry of firms implies that the value  $V$  of a vacancy is zero.

### 2: Incentives in Competitive Search Equilibrium | The Review of Economic Studies | Oxford Academic

*This article proposes a model with dynamic incentive contracts and on-the-job search in a frictional labor market. The optimal long-term contract exhibits an increasing wage-tenure profile.*

### 3: EconPapers: Incentives in competitive search equilibrium

"rdq" /12/21 " page 3 #3 MOEN & ROSA%N INCENTIVES IN COMPETITIVE SEARCH EQUILIBRIUM 3 information.1 Our paper is perhaps most closely related to Kennan ().

### 4: EconPapers: Incentives in Competitive Search Equilibrium

*This paper analyses the interaction between internal agency problems within firms and external search frictions when workers have private information. We show that the allocation of resources is determined by a modified Hosios Rule. We then analyze the effect of changes in the macro economic.*

### 5: Incentives in competitive search equilibrium - LSE Research Online

*"Incentives in competitive search equilibrium," LSE Research Online Documents on Economics , London School of Economics and Political Science, LSE Library. Espen R. Moen & A Rosen, " Incentives in Competitive Search Equilibrium," CEP Discussion Papers dp, Centre for Economic Performance, LSE.*

### 6: Incentives in Competitive Search Equilibrium

*This paper incorporates a classical moral hazard problem with unobserved worker effort and bonus payments into a competitive search equilibrium environ- ment with risk averse workers.*

### 7: ): Incentives in Competitive Search Equilibrium - CORE

*Incentives in Competitive Search Equilibrium Espen R. Moenyand Å~sa RosÃ~nz September 10, Abstract This paper analyses the interaction between internal agency prob-.*

### 8: Incentives in competitive search equilibrium - CORE

*Incentives in Competitive Search Equilibrium Espen R. Moenyand Å~sa RosÃ~nz September 21, Abstract This paper proposes a labor market model with job search frictions where workers.*

### 9: Incentives in Competitive Search Equilibrium - CORE

*Incentives in Competitive Search Equilibrium and Wage Rigidity Espen R. Moenyand Å~sa Rosenz February 7, Abstract This paper examines competitive search equilibrium when workersâ„¸.*

*How a media buyer can make a big difference Where you go is not who you'll be Splendors of the heart Biology 6th edition campbell and reece Woman : maiden, wife and mother Roundhead to royalist List of state highways in maharashtra Desire and its discontents Adventure of the strange ruby The millennium begins Space technologies and climate change Reel 983. Kings (EDs 940-955, 957-959, 961-964, 991-995, 1003-1006, 1009, 1012-1028, 1064, 1065, 1404, 14 Willy banklout botting guide The Many Colors of Crime Coming to terms with security Edexcel gcse physics revision guide answers Immaculate mistake King Alfreds Old English version of St. Augustines Soliloquies New Plays Form A.C.Ts Young Conservatory Volume 5 In Search of Health Happiness Idle hill of summer Blaming God Response to tragedy The Maimonides myth and the great heretic ; Gods image, our mission David Klinghoffer The painted doll affair Ordinances and constitution of the state of Alabama Sports journalism an introduction to reporting and writing Modifications in Indian culture through inventions and loans Devil wind India Edghill Wrestling with myself Quangle Wangles hat Prestashop module development packt Weak Interactions and Neutrinos, WIN99 Yii rapid application development A Fun New Way to Learn Addition New York City neighborhoods The Phoenix Dance Contributions to Louisiana history An unexpected surprise Legend of the Rose of the Alhambra. The Little White Horse Is Moonacre*