

4. Explaining wage determination and the associated implications for labor market adjustment has proven to be a challenge. Consider three alternative candidate models: implicit contract, efficiency wage, and search and matching models with Nash Bargaining. For these three models, address the following questions:

(i) (25 points) Write down and sketch the solution of a simple implicit contract model where workers are risk averse and firms are risk neutral. Your solution should include a characterization of the responsiveness of employment and wages to changes in the state of demand in this model. Does your model exhibit nominal or real wage rigidity? Discuss. Can the model account for sluggish wage responsiveness to an adverse aggregate shock? Discuss. Are wages allocational in this model? Discuss.

(ii) (25 points) Write down and sketch the solution of a simple efficiency wage model where the effort of workers is imperfectly observed by the firm (again your solution should include a characterization of the responsiveness of employment and wages to changes in the state of demand in this model). Does your model exhibit nominal or real wage rigidity? Discuss. Can the model account for sluggish wage responsiveness to an adverse aggregate shock? Discuss. Is the labor market equilibrium efficient? Discuss. Are wages allocational in this model? Discuss.

(iii) (25 points) Write down and sketch the solution of a simple search and matching model where (a) firms face common aggregate and idiosyncratic productivity shocks; (b) workers are homogenous ex ante and have a common reservation value; (c) there is a constant returns to scale matching function that is a function of unemployment and vacancies; (d) to post a vacancy, firms must pay a cost per vacancy; (e) workers have a positive opportunity cost of their time; and (f) firms and workers share the joint surplus of a match with wages determined by Nash Bargaining. After describing the main features of the model, discuss how wages respond to aggregate shocks in this setting. How important is the responsiveness of wages in this model for how employment, unemployment and vacancies respond to aggregate shocks? Discuss. Are wages allocational in this model? Discuss.

(iv) (25 points) Compare and contrast the wage, employment and unemployment implications of these three models? Are these models complements or substitutes in terms of potential implications for understanding the labor market? Discuss.