Solutions to Haltiwanger's August 2008 Comp Question

Part a

Firms maximize expected profits

$$\max_{w(p),l(p).m} \int \left[pg(l(p)) - w(p)l(p)\right] f(p)dp$$

s.t $m \geq l(p)$

$$\int \left[\frac{l(p)}{m}U(w(p)) + \left(1 - \frac{l(p)}{m}\right)U(Y)\right] f(p)dp \geq U(v)$$

Check your class notes for the meaning of the different variables.

FOC

1) $pg'(l(p)) = \bar{w} + \frac{U(Y)-U(\bar{w})}{U'(\bar{w})}$
2) $\mu(p)\left(m - l(p)\right) = 0$
3) $U'(\bar{w}) = \frac{m}{\lambda}$

First order condition 1 implies real wage rigidity. Real wages do not respond to the state of demand. In this model is not wages but contracts that are allocational.

Part b

Workers value functions;

$rV_E^S = w + (b+q)(V_U - V_E^S)$
$rV_E^N = w + b(V_U - V_E^N)$
$rV_U = \bar{w} + a(V_E^* - V_U)$

Incentive compatibility Constraint (ICC) is $V_E^N \geq V_E^S$

In steady state ICC implies

$$\hat{w} = \bar{w} + e + \frac{e}{q}\left(\frac{b}{u} + r\right)$$

Again, check your class notes for the meaning of the different variables.

The model exhibit real wage rigidity only when the economy has relatively high levels of unemployment. The model can only account for sluggish wage responsiveness to an adverse aggregate shock when the economy is currently experiencing high unemployment. The equilibrium is inefficient because there is involuntary unemployment. Wages are allocational in this model.

Part c

Check class notes for the model set-up.

With Nash-Bargaining, workers and firms split the surplus of the match. When firms receive a negative aggregate shock, the surplus of the match is reduced and so is the worker's wage as long as the worker's bargaining power is greater than zero. Therefore, wages are very flexible. The possibility of changing wages in bad states generate lower responses of employment, unemployment and vacancies to aggregate shocks. Wages are not allocational in the Mortensen and Pissarides model.

Part d

Wages are flexible in the Mortensen-Pissarides model and in the Shapiro and Stiglitz model as long as unemployment is not too high. Wages are rigid in the implicit contract model. Therefore, employment and unemployment reacts more to aggregate demand shocks in the implicit contract model than in the Mortensen-Pissarides model.

All these models capture different features of labor markets. Therefore, for a better understanding of labor markets one should combine the main features of the different models.