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Technical Appendix to

FAIR PAY AND A WAGE-BILL ARGUMENT FOR LOW REAL WAGE CYCLICALITY AND EXCESSIVE EMPLOYMENT VARIABILITY

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Appendix: Implementation of the First-Best

The Appendix analyses the range of parameter values for which the first best can be implemented. Take m and m_l to be fixed, and increase m_h, starting from its minimum value $\bar{u} + \alpha L + t$, so that in an efficient allocation there is just full employment in the good state (i.e., where $\tilde{w}_2^h = \bar{u}$). At $m_h = \bar{u} + \alpha L + t$, the following is an equilibrium contract: $(w_1^*, w_2^*) = (f'(L) - t, \bar{u})$. This follows from the fact that it implements the contingent contracts equilibrium with the contingent contract specifying $\tilde{w}_1 = f'(L) - t \equiv m - \alpha L - t$, a wage for the bad state $\tilde{w}_2^l = \bar{u}$ and a wage for the good state $\tilde{w}_2^h = \bar{u}$. If all firms were to offer this contract, each hiring L workers, then each worker receives a utility of w_1 (period 2 utility is zero, whether or not an exogenous separation occurs). All new hires that take place in period 2 (in either state) take place at a wage of $\bar{u}$, and the equilibrium is efficient.

Now consider increasing m_h above $\bar{u} + \alpha L + t$. The contingent contract would be as before, except that now $\tilde{w}_2^h = f_h'(L) - t \equiv m_h - \alpha L - t > \bar{u}$. This implements a first-best allocation since it guarantees efficient employment levels. Suppose that the same non-contingent contract, $(w_1^*, w_2^*) = (f'(L) - t, \bar{u})$, as before, is offered. In the good state, employers would choose either to take on new workers at a wage of $\tilde{w}_2^h$ (this is the equilibrium wage for new hires provided all firms hire), or to make no hires and pay the incumbents $w_2^* = \bar{u}$. Although the non-contingent contract does not specify the wage $\tilde{w}_2^h$ in the good state, because $\tilde{w}_2^h > w_2^*$ the firm is able to deviate from the non-contingent contract by offering a higher wage than that specified. Suppose that all other firms are choosing to make new hires, thus implementing the contingent contract with the wage in the good state being $\tilde{w}_2^h$.

Then provided

$$\overline{\Pi}(w_1^*, w_2^*, \tilde{w}_2^h) \geq \Pi^d(w_1^*, w_2^*), \tag{17}$$

it is an equilibrium for all firms to offer (w_1^*, w_2^*) and hire in the good state. This follows because if all other firms are offering (w_1^*, w_2^*), then $\bar{n}(w_1^*, w_2^*, \tilde{w}_2^h) = L$ (since the contingent contracts equilibrium is implemented), and the going utility for period 1 workers is that of the contingent contracts equilibrium as (17) and assumption A2 guarantee that workers anticipate a wage of $\tilde{w}_2^h$ in the good state. Finally, no other contract can do better than the contingent contracts solution, given the level of utility that has to be offered to workers.

Solving for the critical value of m_h, say m_h^*, such that (17) holds with equality, yields

$$m_h^* = \frac{\alpha L\left[\sqrt{(1+p_h)(1+\gamma^2 p_h)} - 1\right]}{\gamma p_h} + t + \bar{u}. \tag{18}$$

Below m_h^*, the contingent contracts solution can be implemented but above this level of m_h it cannot, as firms simply would not choose to hire in the good state. (Since there is a unique positive solution for m_h^*, and since Π is greater than Π^d at $m_h = \bar{u} + \alpha L + t$ and easily seen to be strictly smaller immediately above m_h^*, it follows that at all values of m_h higher than m_h^*, Π is strictly less than Π^d). Thus instead they would leave wages at $w_2 = \bar{u}$.