Online Appendix

Some Simple Analytics of the Taxation of Banks as Corporations: Effects on Loans and Systemic Risk, Deposits, and Borrowing

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The proofs follow directly from the first order conditions. Let ϕ_L represent the first order condition with respect to L and ϕ_D represent the first order condition with respect to D. Using the implicit function theorem leads to the following.

Proposition 1 Proof:

(A1)
$$\frac{\partial L}{\partial t_A} = -\frac{\partial \phi_L / \partial t_A}{\partial \phi_L / \partial L} = -\frac{-1}{2r_L p'(L) + p''(L) r_L L - \partial^2 C / \partial L^2} < 0$$
$$\frac{\partial D}{\partial t_A} = -\frac{\partial \phi_D / \partial t_A}{\partial \phi_D / \partial D} = -\frac{0}{-p(L)[\partial^2 C / \partial D^2]} = 0$$

Proposition 2 Proof:

(A2)
$$\frac{\partial L}{\partial t_D} = -\frac{\partial \phi_L / \partial t_D}{\partial \phi_L / \partial L} = -\frac{0}{2r_L p'(L) + p''(L) r_L L - \partial^2 C / \partial L^2} = 0$$
$$\frac{\partial D}{\partial t_D} = -\frac{\partial \phi_D / \partial t_D}{\partial \phi_D / \partial D} = -\frac{-1}{-\partial^2 C / \partial D^2} < 0$$

Proposition 3 Proof:

(A3)
$$\frac{\partial L}{\partial t_B} = -\frac{\partial \phi_L / \partial t_B}{\partial \phi_L / \partial L} = -\frac{-(1-k)}{2r_L p'(L) + p''(L) r_L L - \partial^2 C / \partial L^2} < 0$$
$$\frac{\partial D}{\partial t_B} = -\frac{\partial \phi_D / \partial t_B}{\partial \phi_D / \partial D} = -\frac{-\alpha(1-k)}{-\partial^2 C / \partial D^2} < 0$$

Proposition 4 Proof:

(A4)
$$\frac{\partial L}{\partial t_E} = -\frac{\partial \phi_L / \partial t_E}{\partial \phi_L / \partial L} = -\frac{-k}{2r_L p'(L) + p''(L) r_L L - \partial^2 C / \partial L^2} < 0$$
$$\frac{\partial D}{\partial t_E} = -\frac{\partial \phi_D / \partial t_E}{\partial \phi_D / \partial D} = -\frac{-\alpha k}{\partial^2 C / \partial D^2} < 0$$

Proposition 5 Proof:

(A5)
$$\frac{\partial L}{\partial t_\pi} = -\frac{\partial \phi_L / \partial t_\pi}{\partial \phi_L / \partial L} = -\frac{-\left[p(\bar{L}) r_L + r_L L p'(L) - (1-k) r - C_L \right]}{(1-t_\pi)\left[2r_L p'(L) + p''(L) r_L L - \partial^2 C / \partial L^2 \right]} < 0$$
$$\frac{\partial D}{\partial t_\pi} = -\frac{\partial \phi_D / \partial t_\pi}{\partial \phi_D / \partial D} = -\frac{-\left[r_D + r(1-\alpha+\alpha k) - C_D \right]}{-(1-t_\pi)\partial^2 C / \partial D^2} < 0$$