Dynamics of Investment in Response to a Temporary ITC in the q Model.

Answer the following questions using an Abel (1981)-Hayashi (1982) q model of investment.

You are expected to answer the questions not just quantitatively (e.g., with figures or numbers) but also conceptually. That is, you must explain, in intuitive terms, *why* the variables do what they do.

1. Leading up to date t, the economy is in steady state. At date t, the government unexpectedly introduces a permanent increase in the investment tax credit, $\zeta \uparrow$. Show the effects on a phase diagram and show dynamics of investment, capital, share prices, and q following the tax change. Explain why λ, the share price of the firm, *drops* when the ITC is implemented.

2. Leading up to date t, the economy is in steady state. At date t, the government unexpectedly introduces a *temporary* increase in the investment tax credit, $\zeta \uparrow$. The low ITC will last for two years, and then the ITC will revert back to its normal level. Show the effects on a phase diagram and show dynamics of investment, capital, share prices, and q, and the capital stock under two scenarios: (1) costs of adjustment for the capital stock, ω, are high; (2) costs of adjustment are low.

3. Leading up to date t, the economy is in steady state, and an ITC of 20 percent has existed since the beginning of time. At date t, the government unexpectedly *announces* that in three years (that is, in year $t + 5$), there will be a *permanent* decrease in the investment tax credit, $\zeta \uparrow$. Show and explain the effects on a phase diagram and show dynamics of investment, capital, share prices, and q, and the capital stock under two scenarios: (1) costs of adjustment for the capital stock, ω, are high; (2) costs of adjustment are low. EXPLAIN your results

4. Explain why the logic of the examples you just went through helps understand why, whenever a member of Congress introduces a bill to increase the investment tax credit, that bill is always 'retroactive.' That is, if the ITC change ever passes, it will apply to investments made during the period between the introduction of the bill and its passage into law.

References

Abel, Andrew B. (1981): "A Dynamic Model of Investment and Capacity Utilization," *Quarterly Journal of Economics*, 96(3), 379–403.

Hayashi, Fumio (1982): "Tobin's Marginal Q and Average Q: A Neoclassical Interpretation," *Econometrica*, 50(1), 213–224, Available at http://ideas.repec.org/p/nwu/cmsems/457.html.