ECON 161: Economic Issues in Latin America
Problem Set 3.
Out: November 20, 2003. Due: December 2, 2003, 2:30pm, 245 Sequoyah Hall.

1. Consider the following model of corporate illiquidity. There are three periods, $t = 1, 2, 3$. The Acme corporation buys (and installs) a large number of machines in period $t = 1$. Each machine costs 1 and yields R at $t = 3$. For a variety of reasons, Acme finances its capital purchases using short-term debt (renewable in $t = 2$). The debt was issued at a single-period interest rate of r, so Acme owes a return of $(1 + r)$ to its creditors in period $t = 2$. Similarly, for debt that is "rolled over" to $t = 3$, Acme promises to pay $(1 + r)^2$. Because the debt is short-term and must be renewed, any investor can demand $(1 + r)$ in $t = 2$. If so, the firm can "unbolt" a machine from the floor for a cost ϕ and resell it for a price of 1. If Acme's net worth (output minus debt) is negative in any period, the corporation is shut down and the assets are split proportionately among its current creditors. Assume throughout that $r > 0$, $\phi > 0$ and $R > (1 + r)^2$. Assume for the moment that there are no sources of additional capital in $t = 2$.

   (a) Why might it be the case that $\phi > 0$? (Give several examples beyond the labor cost of unbolting the machine.)

   (b) Show that, if all of the investors decide to roll over Acme's debt in $t = 2$, a small, individual creditor has an incentive to be patient as well.

   (c) Now suppose a fraction X of the investors decide not to renew their credit to Acme. What fraction of its assets does Acme have to liquidate? Is this fraction (call it Z) larger or smaller than X? Explain.

   (d) What are Acme's profits in period 3? Above which values of X is Acme insolvent?

   (e) The Bank of International Settlements has proposed that institutions carry large reserves of capital to insure liquidity. What would constitute capital adequacy in this model? (Answer both verbally and quantitatively.)

   (f) Suppose that there were a large lender (a domestic bank, e.g.) that could insure the liquidity needs of many individual firms. Show that it could profitably assume the loans of the creditors who refuse to renew their debt.

   (g) How would things change in part (f) if the liquidity needs of each firm were correlated with each other (for example, if all corporations face more simultaneous withdrawals because of unanticipated capital flight from the country)?

2. (Thought question; not to be handed in.) Write a short essay evaluating the following statement:

   > Economists are concerned that resources are allocated to their most efficient use (i.e., that production is organized efficiently, that no one can be made worse off except by making someone worse off, etc.). On the other hand, inequality is about winners and losers. Therefore, there is no economic rationale for being concerned about inequality.