Economics 103 — Spring 2008

International Monetary Relations

Problem Set 3

May 27, 2008

Due:	**Fri, June 6, 11:30a**
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1 Capital Controls, Monetary Autonomy and Exchange Rate Stability

Suppose a country has strict capital controls in place and restricts capital flows unless approved by the government. Argue that this policy makes the Uncovered Interest Parity condition break down. Use a diagram showing the exchange rate, expected currency returns and real money holdings to verify that the central bank can reduce the domestic interest R to a level of its choice without an effect on the exchange rate.

Now suppose that capital is completely free to flow in and out of the country. However, investors assess the risk of the country's securities as very different from other countries assets. Show how the central bank can reduce the interest rate R without affecting the exchange rate level. [*Hint:* Engineer a *partly* sterilized intervention that moves the risk premium to the right extent.]

2 Debt Sustainability

We speak of a Ponzi scheme when an agent's debt grows at a rate α such that interest payments on existing debt fall short of new borrowing relative to existing debt. What does a Ponzi scheme imply for the relationship between α and the real interest rate r^*? Explain why a Ponzi scheme would leave the borrower with unlimited resources as time passes. Will lenders be willing to tolerate this?

Now suppose that, at some date T in the future, the interest on the debt contracts is anticipated to *permanently* increase to some $r^{*\prime}$ so that $\alpha < r^{*\prime}$ from T on forever. Can the borrower start to accumulate new debt at a rate α from today on? Would your answer change if the interest rate were anticipated to fall back to r^* at some time $T' > T$?

3 Currency Union

The incentives to join a currency union depend on the likely sources of economic shocks and how they would be absorbed when the country joins the monetary

union. Consider two sources of shocks:

- Candidate country M anticipates to suffer large and frequent shocks to money demand. All other things equal, will country M be more likely to join the monetary union than a country with smaller and less frequent shocks?

- Candidate country L has a population that is historically reluctant to move. All other things equal, will country L be more likely to join the monetary union than a country with a more mobile labor force? What would your answer be if the education system in country L awarded many degrees that are little comparable to other countries' degrees in the monetary union?

4 Balance-of-Payments Crisis

A small open economy pegs its exchange rate to a foreign currency at the level $\bar{E}$. The government expands its debt steadily and forces its monetary authorities to buy (monetize) the new debt. The government also requires the monetary authorities to maintain the exchange rate peg as long as they have foreign reserves. Once foreign reserves are depleted monetary authorities float the exchange rate freely.

- In this scenario, government debt and therefore the monetary base expand at a rate μ. Depict the time path of foreign reserves of the monetary authorities. Is the peg sustainable indefinitely?

- Define the *shadow exchange rate*. Use Uncovered Interest Parity and Purchasing Power Parity to express the shadow exchange rate as a function of the monetary base. Depict the time path of the shadow exchange rate.

- Explain why an attack on the currency will occur when the shadow exchange rate hits the exchange rate peg $\bar{E}$. Depict the immediate response of the domestic interest rate and the domestic price level to the attack.

- Are there features of this model that capture elements of the Asian Financial Crisis in 1997? What elements of the Asian Financial Crisis does the model ignore?

5 Self-fulfilling Currency Attack

Consider the following attack game (with foreign and domestic asset holdings such that $W^{\text{CB}} < B^{\text{CB}}$). There is a number J of small investors who all own one unit of currency, and one big investor who owns K units of currency. In the case of a defense, the central bank incurs losses of R per unit of foreign reserves that it has to use for the intervention.

		Central Bank	
Investor i		*Defend* ($\Delta E = 0$)	*Devalue* ($\Delta E > 0$)
	Attack	$-c$ $-R(J+K)$	$\Delta E - c$ $\Delta E(W^{\mathrm{CB}} - B^{\mathrm{CB}})$
	Hold	0 0	$-\Delta E$ $\Delta E(W^{\mathrm{CB}} - B^{\mathrm{CB}})$

- State the condition for a self-fulfilling attack to be an equilibrium.
- Explain under what condition a successful attack becomes a best response for any small investor (among the J investors) when he or she observes the big investor in a fire sale of K units of the currency but the $J-1$ other small investors holding on to the currency.
- Suppose $K = 0$. Investor i and the central bank anticipate that $J-1$ other investors will attempt to attack. Show that a successful attack is an equilibrium for every investor i if there is a large number I of other attacking investors. Also show that a no-attack-no-devaluation equilibrium exists.
- Why is a discrete foreseeable devaluation $\Delta E > 0$ possible in a self-fulfilling crisis but not in a fundamentals-driven crisis?
- Evaluate the following statement.

  > One way to reduce the chance of a self-fulfilling attack is to raise the transaction cost c so that investors are more reluctant to run.

  Is this statement correct in the strategic framework above? Why or why not?

6 Speculation against the European Monetary System

Short before the British government gave in to speculative pressure on the British Pound against the German Deutschemark and abandoned the European Exchange Rate Mechanism (ERM) in September 1992, *The Economist* magazine wrote ("Crisis? What Crisis?", in *The Economist*, August 29, 1992):

> The [British] government's critics want lower interest rates, and think this would be possible if Britain devalued Sterling, leaving the ERM if necessary. They are wrong. Quitting the ERM would

> soon lead to higher, not lower, interest rates, as British economic management lost the degree of credibility already won through ERM membership. Two years ago British government bonds yielded three percentage points more than German ones. Today the gap is half a point, reflecting investors' belief that British inflation is on its way down—permanently.

Evaluate this statement.

- Why might "the British government's critics" have thought it possible to lower interest rates after taking Sterling out of the ERM? Britain's economy was in a recession in fall 1992.
- Why did *The Economist* think the opposite would occur soon after Britain exited the ERM? In what way might ERM membership have lent credibility to British economic policy makers? Britain entered the ERM in 1990.
- Why would elevated British nominal interest rates relative to German rates have suggested an expectation of high future British inflation? Can you think of alternative explanations? Suggest two reasons why British interest rates might have exceeded German rates at the time of the writing of the article, despite the alleged "belief that British inflation is on its way down—permanently."