

SIMON FRASER UNIVERSITY  
Department of Economics

Econ 842  
International Monetary Economics

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Spring 2017

PROBLEM SET 2 - EXCHANGE RATES  
(Due March 22)

1. (25 points). **Exchange Rates and Commodity Prices.** In class we discussed *two* theories of exchange rates - The Balassa-Samuelson model of real exchange rates, and the monetary model of nominal exchange rates. This question asks you to combine the two. As in the monetary model, suppose agents are risk neutral, so UIP holds:  $i_t = i_t^* + E_t s_{t+1} - s_t$ , where  $s_t$  is the log of the nominal exchange rate, defined as the price of foreign currency. Also, continue to assume money demands take the form  $m_t - p_t = y_t - \alpha i_t$ , where  $\alpha$  is the interest rate (semi)elasticity of money demand. Now, however, suppose PPP *doesn't* hold, due to the presence of nontraded goods, as in the Balassa-Samuelson model. In particular, suppose  $p_t = p_t^* + s_t + q_t$ , where  $q_t$  is the log of the real exchange rate (defined as the relative price of home goods).
  - (a) Combine UIP, money demands, and the real exchange rate equation to derive a stochastic difference equation for  $s_t$ . Solve this equation by iterating forward. How does the current exchange rate depend on expectations of the future real exchange rate?
  - (b) By using the logic of the Balassa-Samuelson model, discuss how an expected increase in a country's (exogenous) Terms of Trade would affect  $q_t$ , and therefore  $s_t$ .
  - (c) Following Engel & West (JPE, 2005), explain why exchange rates should help to predict future commodity prices. (For more discussion, see Chen, Rogoff, & Rossi (QJE, 2010), *Can Exchange Rates Forecast Commodity Prices?*).
2. (25 points). Collect quarterly (3-month) data on interest rates and the nominal exchange rate for the USA and Canada, going back as far as possible (but not before 1973). Both interest rates and the exchange rate should be sampled at the end-of-period (not averaged). Interest rates for both countries should be on government Treasury Bills. (I can provide the data if you are having trouble finding it).
  - (a) Plot the data, and comment on any interesting features or time periods.
  - (b) Test Uncovered Interest Parity by regressing changes in the log exchange rate on the interest rate differential. Test the hypothesis that UIP holds.
  - (c) If you reject, briefly discuss a couple of possible interpretations/explanations.