

### Problem Set 4

Due in Lecture on Monday, December 5th. "Box-in" your answers to the algebraic questions.

#### 1. Flexible price monetary model of exchange rates. Assume $\lambda=5$ .

- 1.1 If the money supply increases by 5% today, and stays 5% higher than it was expected to be, in all future periods, what happens to the nominal exchange rate and nominal interest rate today, and into the future?
- 1.2 Suppose the fundamentals are initially expected to grow by 0% per annum. Suppose the expected growth rate increases to 5%. What happens to the exchange rate, if anything, the instant the expected growth rate changes?

#### 2. Sticky price monetary model of exchange rates.

- 2.1 Explain what happens if the monetary authority in US decreases the money supply by 5 percent. In your answer, indicate the time paths of  $M$ ,  $P$ ,  $M/P$ ,  $r-r^*$ ,  $s$ . Use graphs.
- 2.2 Suppose  $\theta$  equals infinity. Redo 2.1.

#### 3. Exchange rate misalignment, purchasing power parity and the Penn Effect

Download the file: [http://www.ssc.wisc.edu/~mchinn/bigmacdata\\_jul16.xlsx](http://www.ssc.wisc.edu/~mchinn/bigmacdata_jul16.xlsx)

Data on Big Mac prices from July 2016 are contained in the file; Column 2 is price in local currency, column 3 is the exchange rate expressed as local currency per USD, and column 4 is the local currency price expressed in USD. Column 5 is per capita GDP in PPP terms.

- 3.1 Calculate the percent misalignment (in log terms) for China, Venezuela, Switzerland, Argentina, using Purchasing Power Parity, using the US as benchmark.
- 3.2 Calculate the percent misalignment (in log terms) for China, Venezuela, Switzerland, Argentina, using the Penn effect, using the US as benchmark. In order to estimate this, run a regression:

$$p_i = \alpha + \beta y_i + u_i$$

Where  $p_i$  is the log of the dollar price of a Big Mac in country  $i$  divided the dollar price of a Big Mac in the US, and  $y_i$  is the log of country  $i$  per capita income divided by US per capita income (both expressed in PPP). The misalignments are then the residuals from the regression.

#### 4. Emerging market policy challenges.

Consider a small open economy with a fixed exchange rate, and imperfect capital mobility.

- 4.1 Suppose the US interest rate rises. Interpret the impact on the small open economy using an IS-LM-BP=0 graph; assume the central bank sterilizes.

4.2 Should the government devalue the currency or raise interest rates. Explain your answer using IS-LM-BP=0 graphs.

4.3 How does your answer change if the country (firms, the government) has a big outstanding debt borrowed in US dollars?

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