Introduction to Political Economy 14.770
Problem Set 4

Due date: November 8, 2017.

Question 1:

Consider the Dal Bó and Dal Bó (2011) / Dube and Vargas (2013) model of commodity prices and civil conflict. Assume that country X has two productive sectors, sector 1 and sector 2. Both of these sectors employ two factors of production: *capital* with a rental price r, and *labor* with a rental price w. The productive sectors involve many firms which maximize profits and use technologies characterized by constant returns to scale. The factor endowments in the economy are available in fixed amounts, $\overline{K}$ and $\overline{L}$.

Let y_1 be the output of sector 1, y_2 be the output of sector 2, and let p denote the relative price of good 1 in terms of good 2: p_1/p_2.

Government charges a tax rate to capital income resulting in revenue

$$R = \tau \cdot r \cdot \overline{K}$$

The third sector in the economy is the *rent seeking* sector. This sector only uses labor (L_s) and appropriates a fraction $s(L_s)$ of tax revenue, where $s'(L_s) > 0$, $s''(L_s) < 0$. The total appropriation from rent seeking is divided among those in that sector, which yields a per capita rent of

$$\frac{s(L_s)}{L_s}\left(\tau \cdot r \cdot \overline{K}\right)$$

Denote a_{iK} the capital requirements in the production of good i and similarly denote a_{iL} the labor requirements in the production of good i, so that making a unit of good i requires a_{iK} units of capital and a_{iL} units of labor.

1. Write down the equilibrium conditions of the model assuming perfectly competitive markets in the two goods, and assuming that labor earners

can move freely between the productive sectors and the rent seeking sector.

2. Assume that good 1 is more capital intensive than good 2, $a_{1K}/a_{1L} > a_{2K}/a_{2L}$. What is the effect of an increase in the relative price p on the number of people in the rent seeking sector?

3. Now assume that there is a decline in the stock of capital in the economy, $\overline{K}$. What is the equilibrium effect of this capital stock reduction on the number of rent seekers and the production of the two goods? Explain the intuition behind the results.

Question 2:

Several recent papers have looked at the relationship between rainfall and conflict risk. In this exercise you will be asked to explore this relationship drawing on the debate between Miguel et al. and Ciccone.

1. Briefly summarize the empirical strategy in Miguel et al (2004), their main specification and the argument made by Ciccone (2011).

2. Now skim through Miguel's response (Miguel and Satyanath, 2011). What are their counterarguments?

3. What is your stance on this debate? Is there any other specification you would like to try with the available data?

4. Excessive rain can be harmful for agriculture and for the economy as a whole, if it produces floods. Is this addressed in any of the papers above? How could it be?

5. Can you think of reasons why the exclusion restriction in Miguel et al. would not hold? If you had access to unlimited data, how would you check this?

References

Ciccone, Antonio (2011). "Economic Shocks and Civil Conflict: A Comment", *American Economic Journal: Applied Economics* 3(4): 215-27.

Dal Bó, Ernesto and Pedro Dal Bó (2011). "Workers, Warriors, and Criminals: Social Conflict in General Equilibrium", *Journal of the European Economic Association* 9(4): 646-677.

Dube, Oeindrila and Juan F. Vargas (2013). "Commodity Price Shocks and Civil Conflict: Evidence from Colombia", *Review of Economics Studies* 80(4): 1384- 1421.

Miguel, Edward, Shanker Satyanath and Ernest Sergenti (2004). "Economic Shocks and Civil Conflict: An Instrumental Variables Approach", *Journal of Political Economy* 112(4): 725-753.

Miguel, Edward, and Shanker Satyanath (2011). "Re-examining Economic Shocks and Civil Conflict", *American Economic Journal: Applied Economics* 3(4): 228-32.