Intermediate Macro Quiz 1

June 8, 2016

1   Returns to Scale

Do the following production functions exhibit increasing, decreasing, or constant returns to scale?

1. $Y = K^{\frac{2}{3}} L^{\frac{2}{3}}$

2. $Y = K + L$

3. $Y = K^{\frac{1}{3}} L^{\frac{2}{3}} + \bar{A}$

2   South Sudanese Explosion

South Sudan is the youngest country in the world. After many years of civil war with its former countrymen in Sudan to the north, the breakaway nation finally gained international recognition in 2011 after the cessation of hostilities with Sudan. The new country managed to secure control of about 75% of the former country's total oil revenues, which were substantial given the large supply of oil within the country's former borders.

Between 2013 and 2014, the growth rate of the South Sudanese economy was over 30% (the global growth rate is between 2% and 3%).

Draw a graph from the context of the Solow model which could explain this explosive growth rate.

3   Convex Depreciation

Suppose that instead of being linear, depreciation was quadratic, so that net investment was given by $\Delta K_{t+1} = I_t - \delta K_t^2$. How would this affect the Solow economy?

Calculate a new steady-state capital stock and a new steady-state output level in terms of the model parameters.