# READING REVIEW 4

SEAN RICHARDSON, ECONOMIC DEVELOPMENT

In this reading review I will discuss Roland Chapter 4. The chapter begins in pointing out the economic growth of China and India. The importance of looking economic growth in developing countries serves as a motivation for the more technical contents. To begin the analysis of economic growth, Roland first introduces factors of production — primarily labor $L_t$ and capital $K_t$. Then, the production function $F$ takes in the factors of production as inputs and returns the value of outputs in the economy $Y_t$. A specific example is the Cobb-Douglas production function:

$$\text{(Cobb-Douglas)} \qquad Y_t = A_t K_t^{\alpha} L_t^{1-\alpha} \qquad 0 \leq \alpha \leq 1$$

The chapter than analyzes various aspects of this equation.

Firstly, I would like to point out the well known mathematical relation (assuming continuous second derivatives)

$$\frac{\partial}{\partial L_t}\left(\frac{\partial Y_t}{\partial K_t}\right) = \frac{\partial}{\partial K_t}\left(\frac{\partial Y_t}{\partial L_t}\right)$$

What we can take from this is that a small change in labor will affect the marginal change in capital a similar amount that a small change in capital will affect a marginal change in labor. Additionally, I have one concern regarding the logic leading up to the expression of the factor shares. The given formula for the labor shares relies on the value of $\frac{\partial F}{\partial L_t}$ and $\frac{\partial F}{\partial K_t}$ reaching the natural equilibrium of the wage rate and interest rate respectively, maximizing return return. However, under Cobb-Douglas equation with a constant return to scale variable $A_t$, I feel it is important to address that it is mathematically possible to adjust the inputs so that the partial derivatives can match these values for any of the given values. In fact, because the expressions of both partial derivatives are heavily reliant on the fraction $\frac{K_t}{L_t}$, I would guess that this is not true for the Cobb-Douglas equation with constant $A_t$. Overall, I appreciated this more mathematical approach to economics. It seems as though the mathematics are well thought out and there is a lot to learn from them.