

$\Delta x \rightarrow 0$  to our quotient. Thus, we have  
 $\lim\{\Delta x \rightarrow 0\} \Delta x/x = dx/x = \partial x/x$ .

Thus, to represent [8] and [9] as relative changes, we have

$$\begin{aligned}\partial x^*/\partial A &= (\partial x^*/x^*)/(\partial A/A) = (\partial x^*/x^*)(A/\partial A) = (\partial x^*/\partial A)(A/x^*) \\ &= (B/(1-A)^2)(A/(B/(1-A))) = A/(1-A)\end{aligned}$$

$$[10] \quad \partial x^*/\partial A = A/(1-A)$$

$$\begin{aligned}\partial x^*/\partial B &= (\partial x^*/x^*)/(\partial B/B) = (\partial x^*/x^*)(B/\partial B) = (\partial x^*/\partial B)(B/x^*) \\ &= (1/(1-A))(B/(B/(1-A))) = 1\end{aligned}$$

$$[11] \quad \partial x^*/\partial B = 1$$

This shows that for every 1% change in A, there is a percent change of  $A/(1-A)$  in  $x^*$ . For example, if  $A = 0.1$ , we see that  $A/(1-A) = 0.1/0.9 = 0.\bar{1}$ . Thus, for every 1% increase in A when  $A = 0.1$ , there is a 0.1% change in the value of  $x^*$ . However, if  $A = 0.99$ ,  $0.99/0.01 = 99$ . Thus, for every 1% increase in A when  $A = 0.99$ , the value of  $x^*$  increases by 99%.

Our findings show that as  $A \rightarrow 0$ , changes in A have minimal effect to changes in  $x^*$ . Alternatively, as  $A \rightarrow \pm 1$ , changes in A have a pervasive effect to changes in  $x^*$ .

However, changes in B have a constant minimal effect on  $x^*$ , with every 1% change in B yielding a 1% change in  $x^*$ . This demonstrates that the linearized variable B has little influence over the linearized logistic system as a whole.

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