

## Chapter 14: Comparative statics

Comparative statics can be used to derive the effect of a variable on another variable. For example; the effect of income change in the market of a certain good.

Steps for deriving the comparative-statics effect (for example effect of change in money supply,  $M$ ):

1. Set the equilibrium conditions (for the IS-LM model)
2. Take the total differential from the equilibrium conditions with respect to the endogenous and exogenous variables of interest. (in this case  $Y$ ,  $R$  and  $M$ )
3. Divide the total differentials by the change in the variable you investigate (in this example  $dM$ )
4. Rewrite the result in a matrix form. This is done with the **implicit function theorem**. Rewrite so that you have  $dY/dM$  and  $dR/dM$  in a single place in the matrix.
5. Solve for the effects; solve for  $dY/dM$  and  $dR/dM$

The **envelope theorem**: if we want to know how the maximum depends on the parameters, we can ignore the variables and just take the derivative to the parameters. This theory can be used to derive the comparative-static effect on an objective function.

### Steps for comparative-static effect on objective function:

1. Solve the model in terms of parameter  $\alpha$
2. Insert the results into the objective function
3. Compute the comparative-static effect by differentiating with respect to  $\alpha$