# Modeling Supply

Short Course on CGE Modeling, United Nations ESCAP

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- Now that we have modeled the firm's production decision, we will complete a basic model of supply.
- We will consider two cases. In the first we will assume that all factors of production are mobile between economic activities.
- Next we will show how exception handling can be used to introduce specific factors.

- The long-run production problem
- Building the model in GAMS
- Section 2 Sectio

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- Consider the problem of maximizing the value of total output (GDP), at given prices, subject to the constraints imposed by resource limitations.
- This sounds like a social planning problem and may in fact be viewed as such, it is not necessary to do so. When there are no factor market distortions, factor endowments are fixed, and competition prevails, the market maximizes the value of output at given output prices.
- We will start with the two factor, two good case.
- Both factors are assumed to be mobile.

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The problem can be written:

max  $\mathscr{L} = p_1 q_1(K_1, L_1) + p_2 q_2(K_2, L_2) + \lambda [\bar{K} - K_1 - K_2] + \mu [\bar{L} - L_1 - L_2]$ 

The first order conditions are:

$$\begin{split} \partial \mathscr{L} / \partial K_1 &= p_1 \partial q_1 / \partial K_1 - \lambda = 0\\ \partial \mathscr{L} / \partial L_1 &= p_1 \partial q_1 / \partial L_1 - \mu = 0\\ \partial \mathscr{L} / \partial K_2 &= p_2 \partial q_2 / \partial K_2 - \lambda = 0\\ \partial \mathscr{L} / \partial L_2 &= p_2 \partial q_2 / \partial L_2 - \mu = 0\\ \partial \mathscr{L} / \partial \lambda &= \bar{K} - K_1 - K_2 = 0\\ \partial \mathscr{L} / \partial \mu &= \bar{L} - L_1 - L_2 = 0 \end{split}$$

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- Under competitive conditions, the shadow values on the resource constraints are factor prices.
- Hence, at an optimum, each factor price is equal to the value of the marginal product of that factor in each industry.
- Also at an optimum, resources are fully utilized.

## Geometric Interpretation



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### Geometric Interpretation



### 预览已结束,完整报告链接和二维码如下:

https://www.yunbaogao.cn/report/index/report?reportId=5\_6920

