

Quadrant II – Transcript and Related Materials

Programme: Bachelor of Arts (Third year)

Subject: Economics

Paper Code: ECD 112

Paper Title: Growth and Development Paper II

Unit: I

Module Name: Capital and labour-saving technical progress

❖ NOTES:

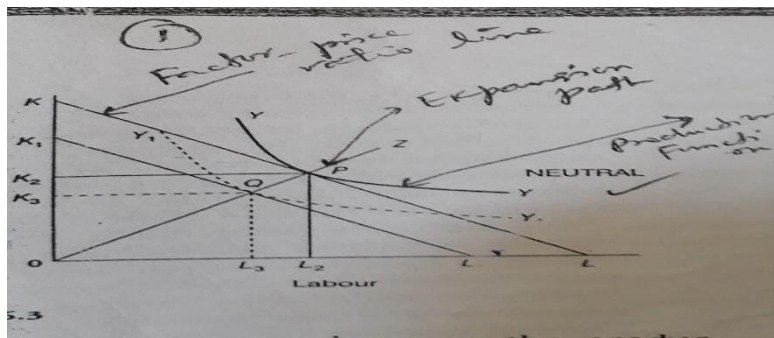
• Capital and Labour-Saving Technical Progress

The classification of technical progress as to whether it is capital-saving, labor-saving or neutral owes its origins primarily to the work of Harrod (1948) Hicks (1932). The criteria of classification differ however Harrods classification of technical progress employs the concept of the capital output ratio.

Given the rate of profit technical change is said to be capital-saving if it lowers the capital output ratio. Labour saving if it raises the capital output ratio and neutral if it leaves the capital output ratio unchanged. The nature of technical progress by this criterion will be an amalgam of the effect of “pure” technical change on factor combinations and the effect of the substitution of capital for labour.

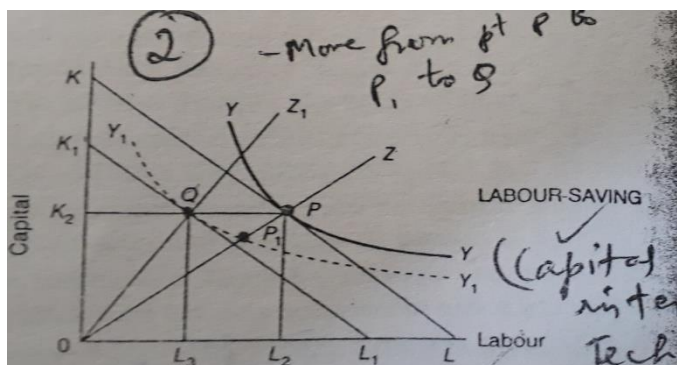
As such Harrod neutrality at the aggregate level is quite consistent with capital-saving technical progress at industry level. In fact, the most of the evidence for advanced countries suggest that if technical progress is neutral in the aggregate in the Harrod sense this must be due to substitution of capital and labour because “pure” technical advanced has saved capital.

Neutral technical progress:



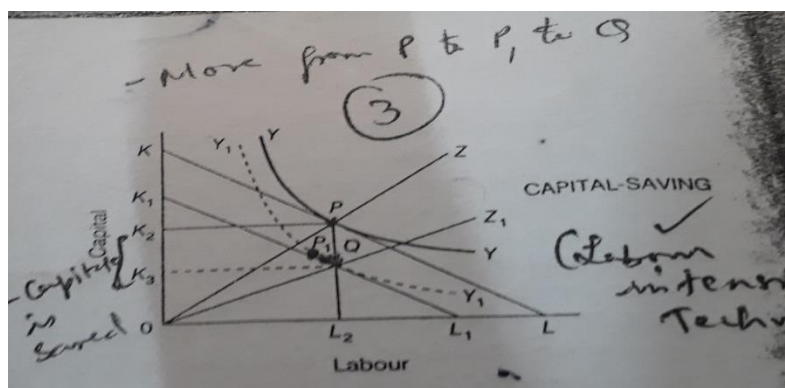
From the ray of origin or expansion path OZ goes through the minimum cost point of tangency between the production function YY and factor price ratio line KL. With neutral technical progress the production function shifts such that the new point of tangency at the same factor price ratio lies on the same expansion path. The condition for neutral technical progress is simply that the new production function is parallel to old.

Labour-saving technical change:



The ratio of the marginal product of capital to the marginal product of labour rises such as to shift the minimum cost point of tangency from old expansion path OZ to new expansion path OZ₁ at P₁ where new production function cuts the old expansion path the ratio of marginal product of labour to capital is lower at P. P₁ is not equilibrium point and it will pay producers to move to point Q substituting capital for labour. At L₂ and L₃ labour is saved.

Capital-Saving technical progress:



In this case marginal product of labour to the marginal product of capital rises and the shift in the production function is such that the minimum cost point of tangency now lies to the right of old expansion path. At P1 new production function cuts the old expansion path. The ratio of marginal product of labour to capital is higher than at P. Again, P1 is not equilibrium. It will pay producers to move to point Q substituting labour for capital. K2 and K3 capital are saved.