LET US SEE WHAT HAPPENS IF THE CONSTRAINT $x_1 + x_2 = 3$ IS CHANGED TO $x_1 + x_2 = 6$

AT OPTIMAL $x_2^* = 2x_1^*$

HOWEVER $x_1 + 2x_1 = 6 \Rightarrow x_1^* = 2 ; x_2^* = 4$

$\therefore g(x^*) = 3 \times 2 \times 4^2 = 96.$

$$96 \neq 12 \times (6-3) + 12$$

THIS SHOWS THAT THE INTERPRETATION OF λ_j GIVEN EARLIER IS AT BEST VALID FOR SMALL CHANGES IN b_j.

IT CAN BE SHOWN THAT THE ABOVE IS INDEED TRUE.

$$\frac{\partial \mathcal{L}}{\partial b_j} = \lambda_j$$

AT OPTINUM $h_j(x) = b_j$ HENCE $g(x^*) = \mathcal{L}^*$

HENCE AT OPTINUM $\frac{\partial g^*}{\partial b_j} = \frac{\partial \mathcal{L}}{\partial b_j} = \lambda_j$

HENCE λ_j at optimum gives the rate of change g^* for small change in b_j.

λ_j is called the "shadow price" of resource j.