(10) $\Delta U_l = i_l \frac{\partial U_l}{\partial A_l} \Delta C_l + \frac{\partial U_l}{\partial A_l} i_l \Delta S_l$, or

(11) $\Delta U_l = i_l \frac{\partial U_l}{\partial A_l} \Delta Y_l$.

We define a Social Welfare Function for all the individuals l in the economy.

(12) $W = \Sigma_l U_l$.

Then

(13) $\Delta W_c = \Sigma_l \frac{\partial U_l}{\partial A_l} i_l \Delta Y_l$, where c refers to costs.

We assume that $\frac{\partial U_l}{\partial A_l}$ is the same for all individuals and equal to the arbitrary constant α. Then

(14) $\Delta W_c = \alpha \Sigma_l i_l \Delta Y_l$.

ΔW_c measures the costs in the analysis. The benefits are a flow of future annual income accruing to various individuals, or

(15) $B = \Sigma_l \Delta B_l$.

Assuming the value of marginal future income the same for beneficiaries as for taxpayers, we have

(16) $\Delta W_b = \alpha \Sigma_l \Delta B_l$.

In order for a project to represent a favorable economic change, the value of benefits must exceed the value of costs, or $\Delta W_b > \Delta W_c$. This requires

(17) $\alpha \Sigma_l \Delta B_l > \alpha \Sigma_l i_l \Delta Y_l$.

This inequality is unaffected by the value for α. For convenience, let $\alpha = 1$. Then the criterion becomes

(18) $\Sigma_l \Delta B_l > \Sigma_l i_l \Delta Y_l$ or

(19) $\frac{\Sigma_l \Delta B_l}{\Sigma_l i_l \Delta Y_l} > 1$.

Use of the interest rate that our analysis seeks to estimate for benefit-cost analysis is equivalent to criterion (19). We have esti-