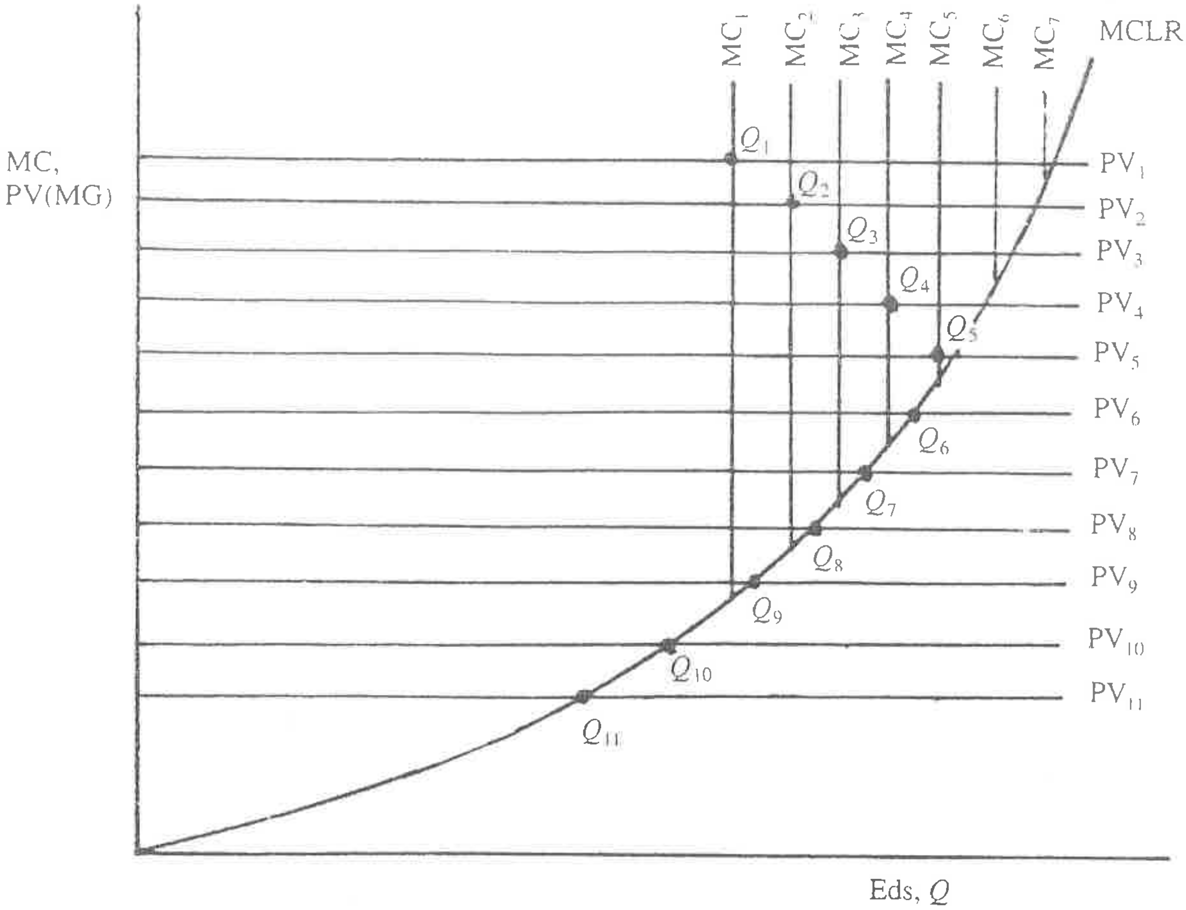
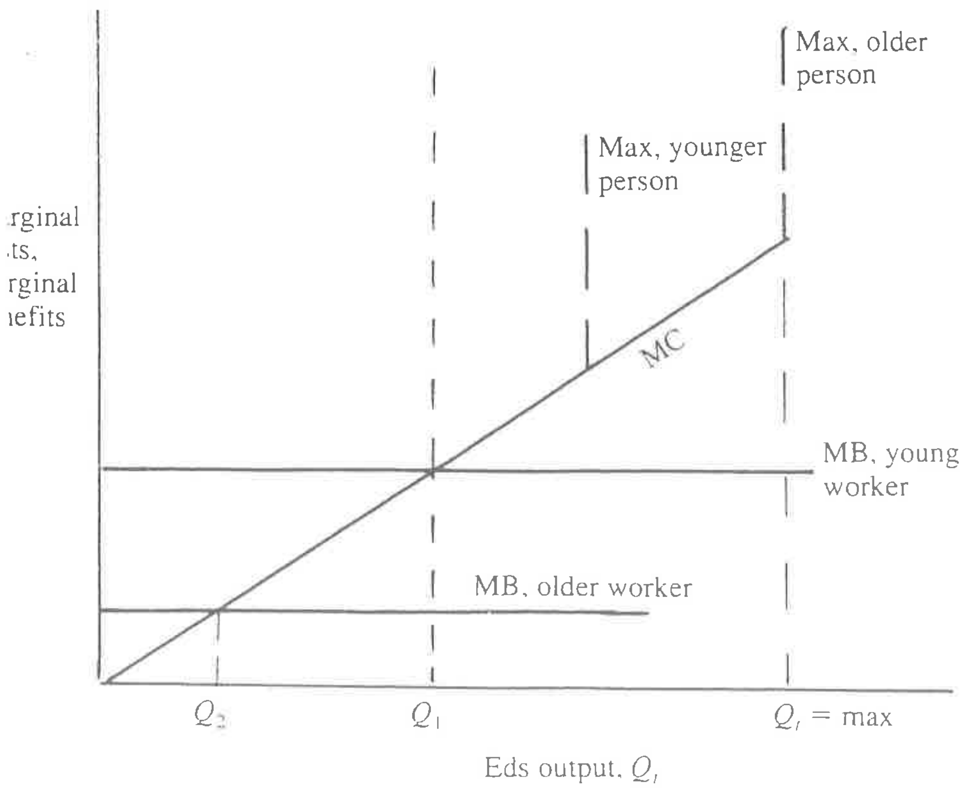
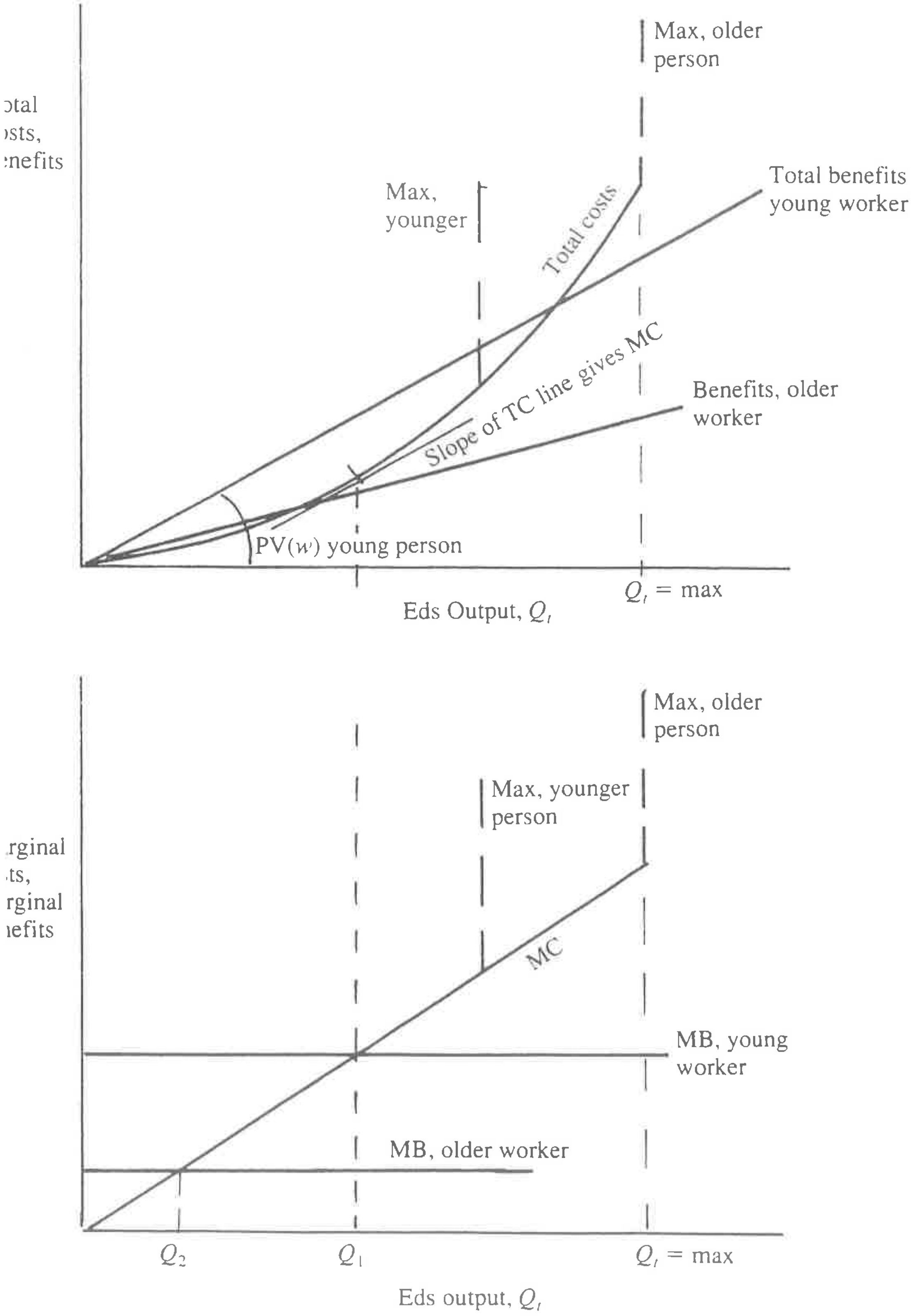


Figure 3.2 The sequence of human capital outputs during and after school

Eds Output, Q_t



ure 2.6 Total and marginal benefits and costs of producing eds



ure 2.6 Total and marginal benefits and costs of producing eds

ially human capital is a very profitable investment, but the individual not produce enough of it, and so chooses $s_t = 1$. Q_t then declines con- ously as one gets older reaching zero at retirement. Accumulated human ital is computed by adding the annual investments. The process of adding rly human capital investments yields a stock of human capital curve, K_t, as icted in figure 2.7. Note that the stock of human capital increases quickly he period when $s_t = 1$, then more slowly in middle age, and stops increas-

• SIMPLE MODEL OF OPTIMIZING INVESTMENT INTO HC

Ben Porath

$E_t = E_{t-1} + r C_{t-1}$; $C_t = C_0 [1 - \frac{t}{T}]$

or

$dE_t = r C_{t-1}$ $\frac{C_t}{E_t} = k_0 [1 - \frac{t}{T}]$

$w \equiv 1$ (assume)

r … discount rate

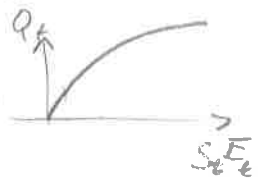
s … as k - time allocation to study

• OPTIMIZATION ON C_t

we know $\frac{\Delta \$}{r}[1 - \delta^T] \geq \Delta Costs$

1) Assume $E_t = E_{t-1} + Q_t \equiv \frac{dE_t}{dt} = Q_t$, $w = 1$

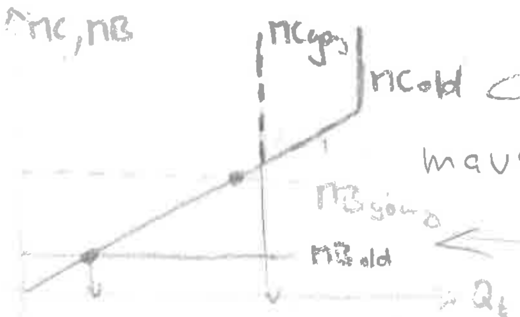
2) HC prod. fcion: $Q_t = (S_t E_t)^b$, $0<b<1$, $0 \leq S_t \leq 1$ (choice, b … ability; $S_t E_t$ … costs)



3) Compare marginal costs: $COST_t = S_t E_t \Rightarrow COST_t = Q_t^{1/b}$

$MC = \frac{\partial C_t}{\partial Q_t} = \frac{1}{b} Q_t^{(1-b)/b}$

for b = .5



marginal benefits: $BEN_t = \frac{1}{r}\left(1 - \frac{1}{(1+r)^{T-t}}\right) Q_t$

$MB_t = \frac{\partial BEN_t}{\partial Q_t} = \frac{1}{r}\left(1 - \frac{1}{(1+r)^{T-t}}\right)$

$MC = MB \Rightarrow \frac{\partial BEN_t}{\partial Q_t} \stackrel{!}{=} \frac{\partial COST_t}{\partial Q_t} \Rightarrow \underbrace{\frac{1}{r}\left(1 - \frac{1}{(1+r)^{T-t}}\right)}_{MB} = \underbrace{\frac{1}{b} Q_t^{(1-b)/b}}_{MC}$

	Q_t^*	
r	↘	→ lower growth of earnings E_t
b	↗	→ higher growth of E_t, Y_t
$\frac{t}{T}$	↘	

$Q_t^* = \left[\frac{b}{r}\left(1 - \frac{1}{(1+r)^{T-t}}\right)\right]^{b/(1-b)}$

↓ see graph

$\int dE_t^* = \int Q_t^* dt$

↓

$E_t^* = E_s + \dots \Rightarrow S_t^* = \frac{Q_t^{*\,1/b}}{E_t^*}$

$Y_t = E_t - S_t E_t = (1 - S_t^*) E_t^*$

It could be that $S_t^* > 1$ → Full time

MB > MC