Morlok pp 32

Economic Role of Transportation

Economics concerned with Production distribution & consumption of Goods & Services which are of value to humans - of wealth

The Place, Time & Quality Utility of Goods

p 33 Fig 2.1

Dist. Vs Cost Curves

$$P = A + B \cdot d$$

P: Transp. cost; A: constant; B: ; d: dist.

Origin Zone — Mumbai

Destination Zone — W. B

Orissa

Chennai

Karnataka

A P

Kerala

Delhi

Jaipur

?: Find rate in Rs/40kg = A + B x Kms.

p. 40 Fig 2-4 Different effects of Transport improvements on two production centres

Cost Vs dist.

Ch 10 TRANSPORTATION DEMAND

P413

p 414 Price Vs Demand

Fig 10-1

& Price elasticity of demand

Demand Functions or Schedules

Total cost of a commodity (consisting of price at origin plus transport cost) and its relationship to place utility.

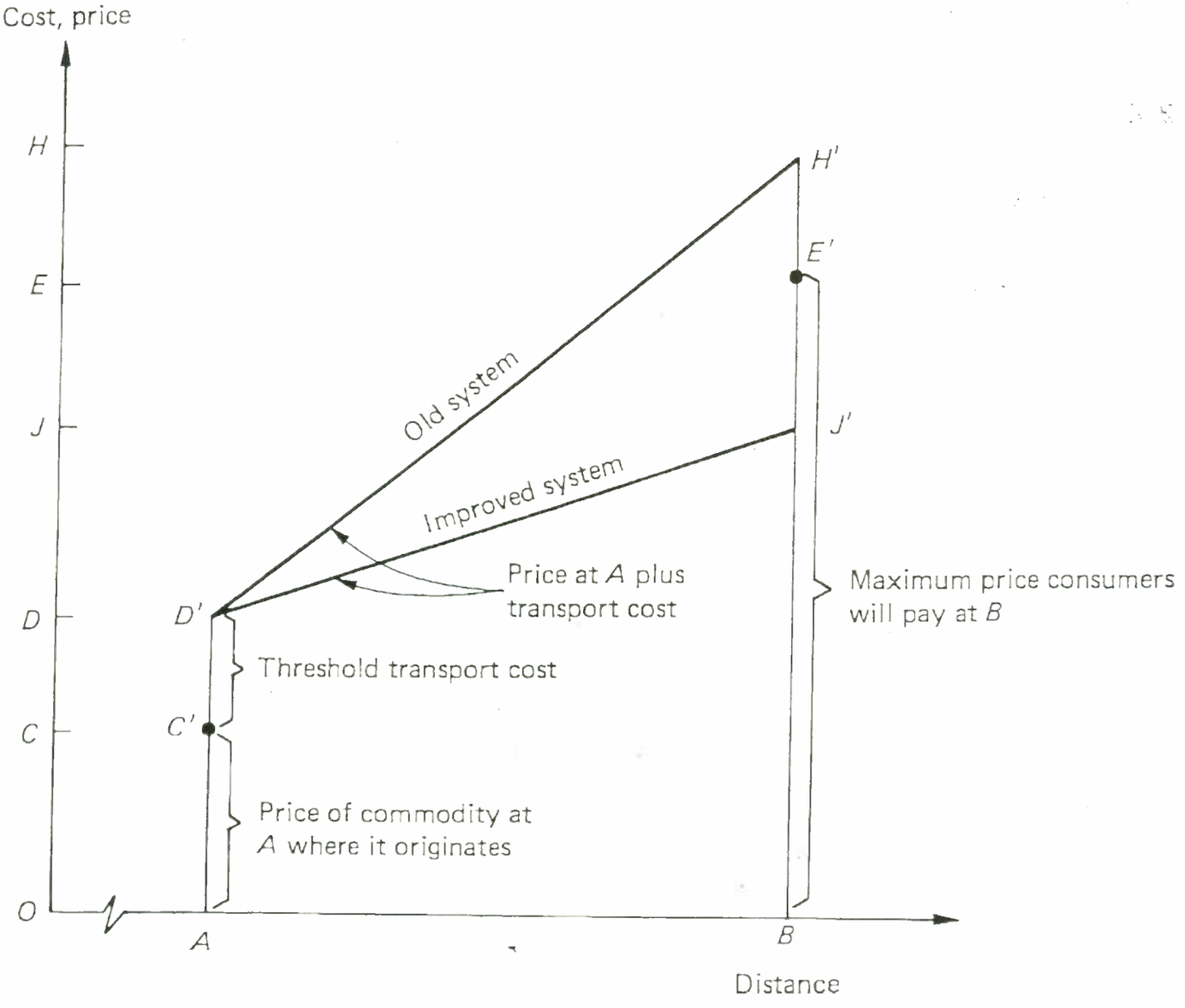
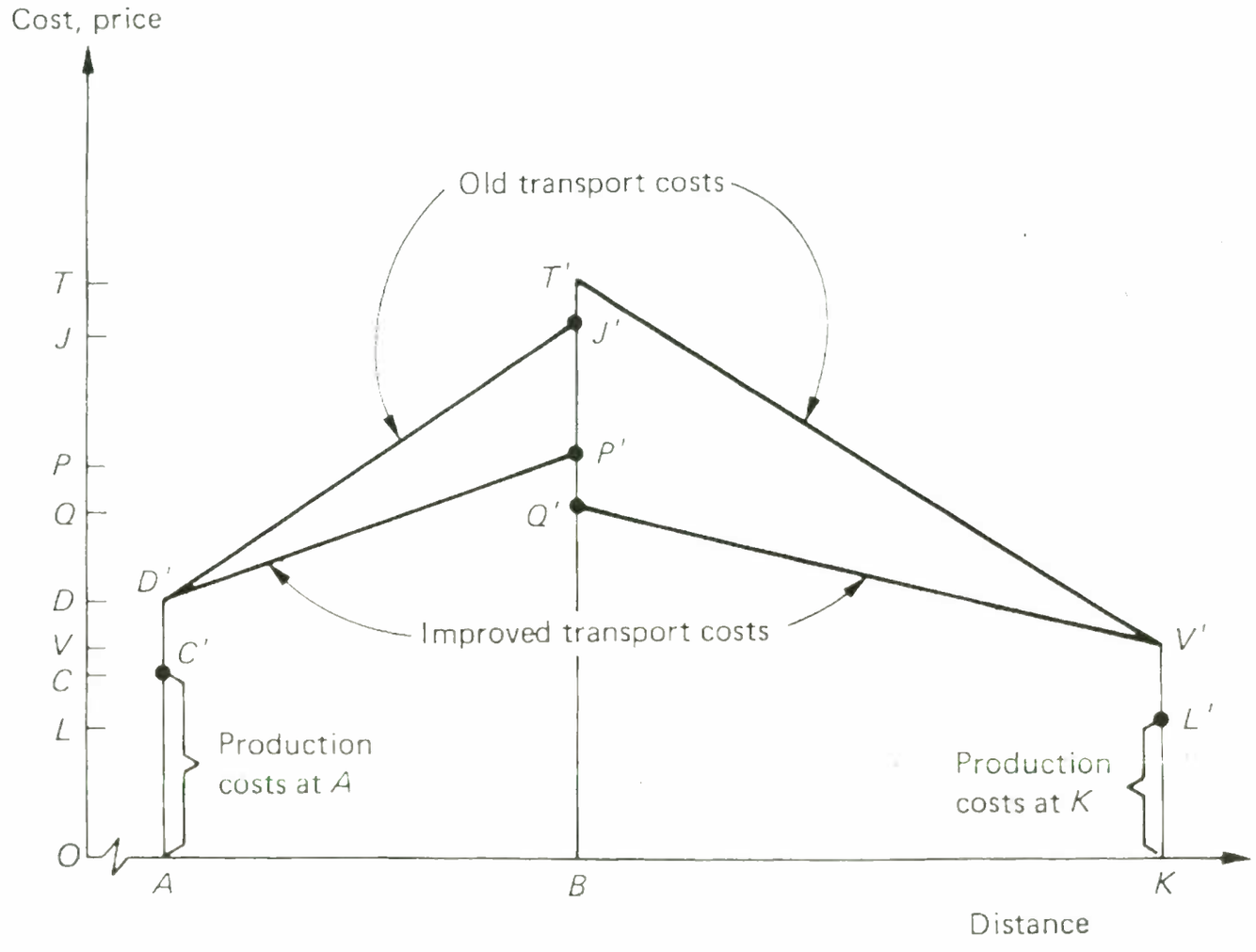


Figure 2-4 **Differential effects of transport improvements on two production centers.**



Total cost of a commodity (consisting of price at origin plus transport cost) and its relationship to place utility.

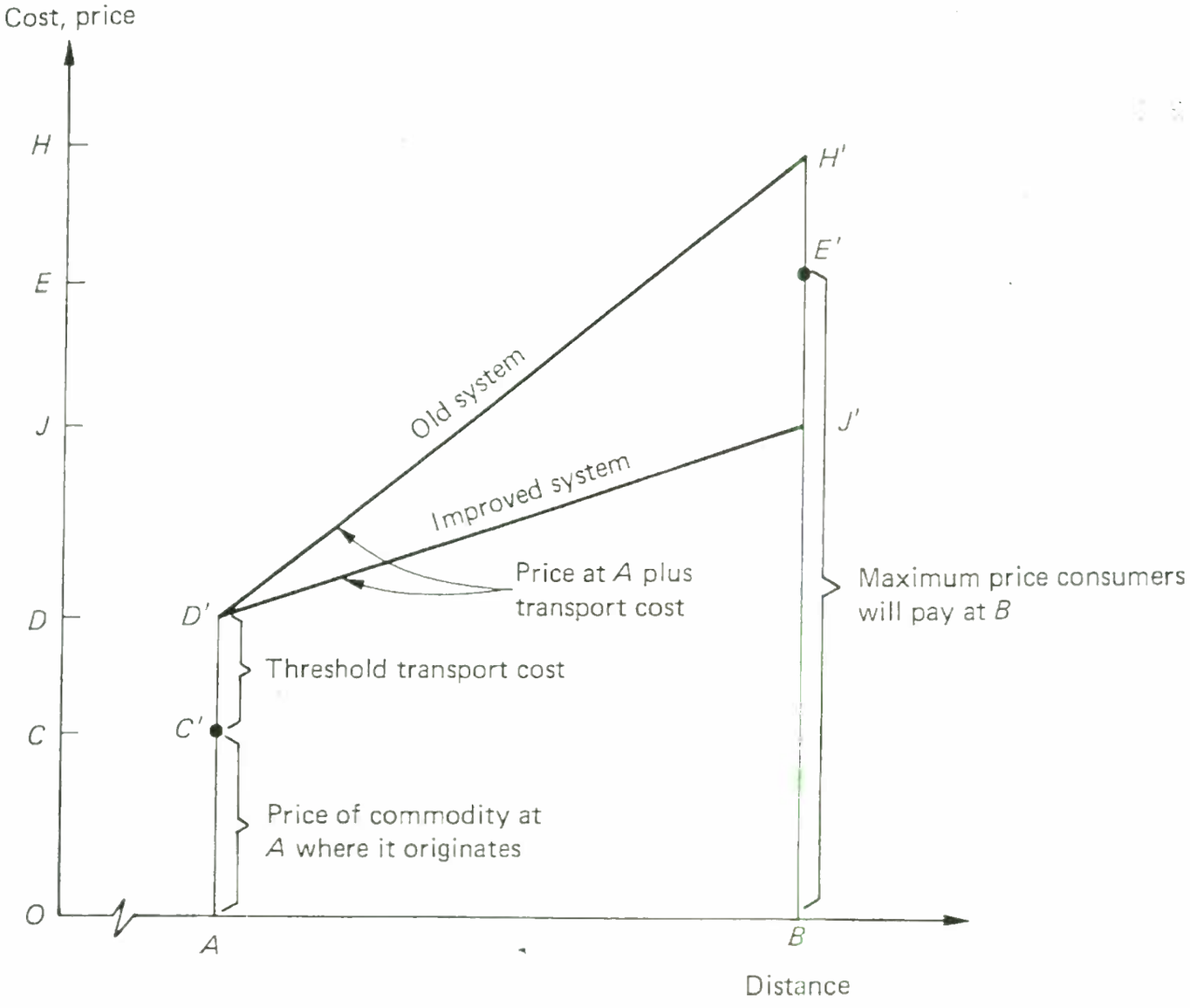
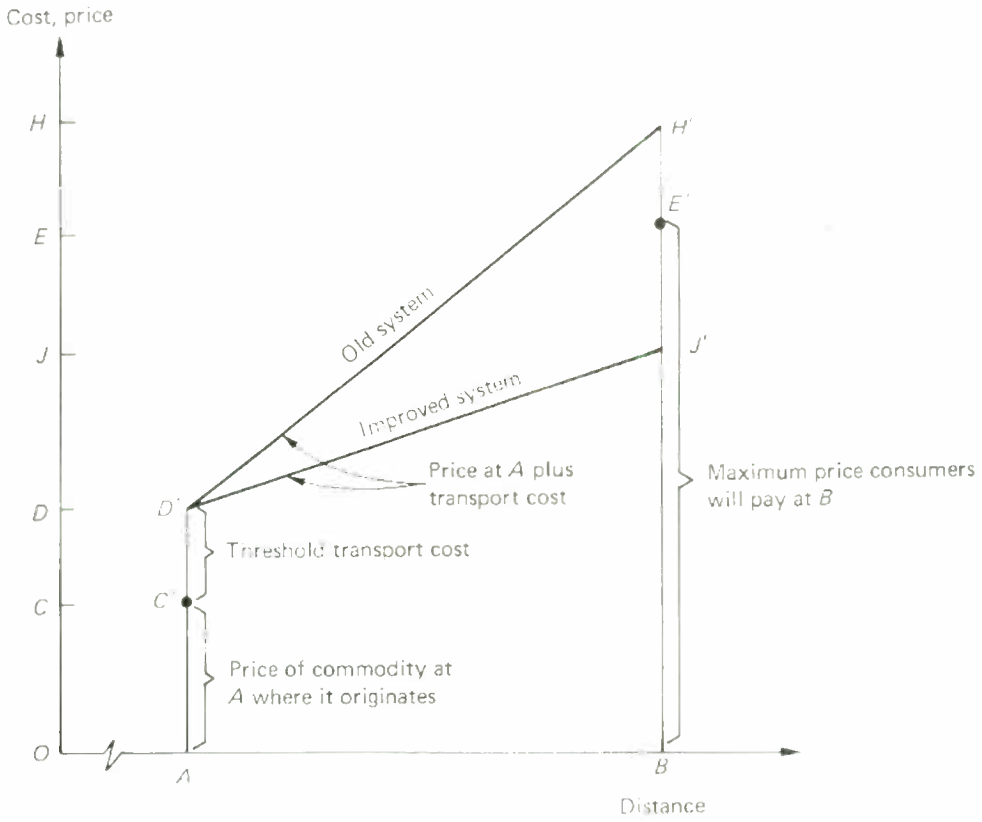


Figure 2-1 Total cost of a commodity (consisting of price at origin plus transport cost) and its relationship to place utility.



willing to pay of *OE*, and hence none of this commodity will be shipped from *A* to *B*. If *B* were the only point of possible consumption of this commodity produced at *A*, none would be produced at *A* under these circumstances.

Consider the effect of an improvement in the transport system which reduces the cost per unit distance of movement from *A* to *B* to the slope of the line *D'J'*. This might result from upgrading the road or replacing unpaved roads with rail transport, to mention two examples. The resulting total cost at *B* would then be reduced to *OJ*. Since this price is less than the maximum for consumption to occur, the commodity would be sold and consumed at *B*, transported from *A* to *B*, and hence produced at *A*.

In economic terminology, the reduction in the transportation cost between *A* and *B* has given *place utility* to the goods produced at *A*. Whereas these goods would have no value with the high transport cost because they could not be sold in the market, with the lower transport cost they have a value. Specifically, with a total transport cost of *CJ*, the price charged for the good at *A* could be raised by as much as *JE*, and the consumption and hence production and transport still occur. At any price delivered at *B* greater than *OE*, the value at *A* would be zero. Thus transport gives utility to the goods, in the sense that it determines the value of goods at one location in relation to the price at which they might be sold at any other location. It is in this sense that transport gives place utility to goods.

Another closely related concept is that of the *time utility* of goods. The demand for a good may occur during only a particular period of time and

Total cost of a commodity (consisting of price at origin plus transport cost) and its relationship to place utility.

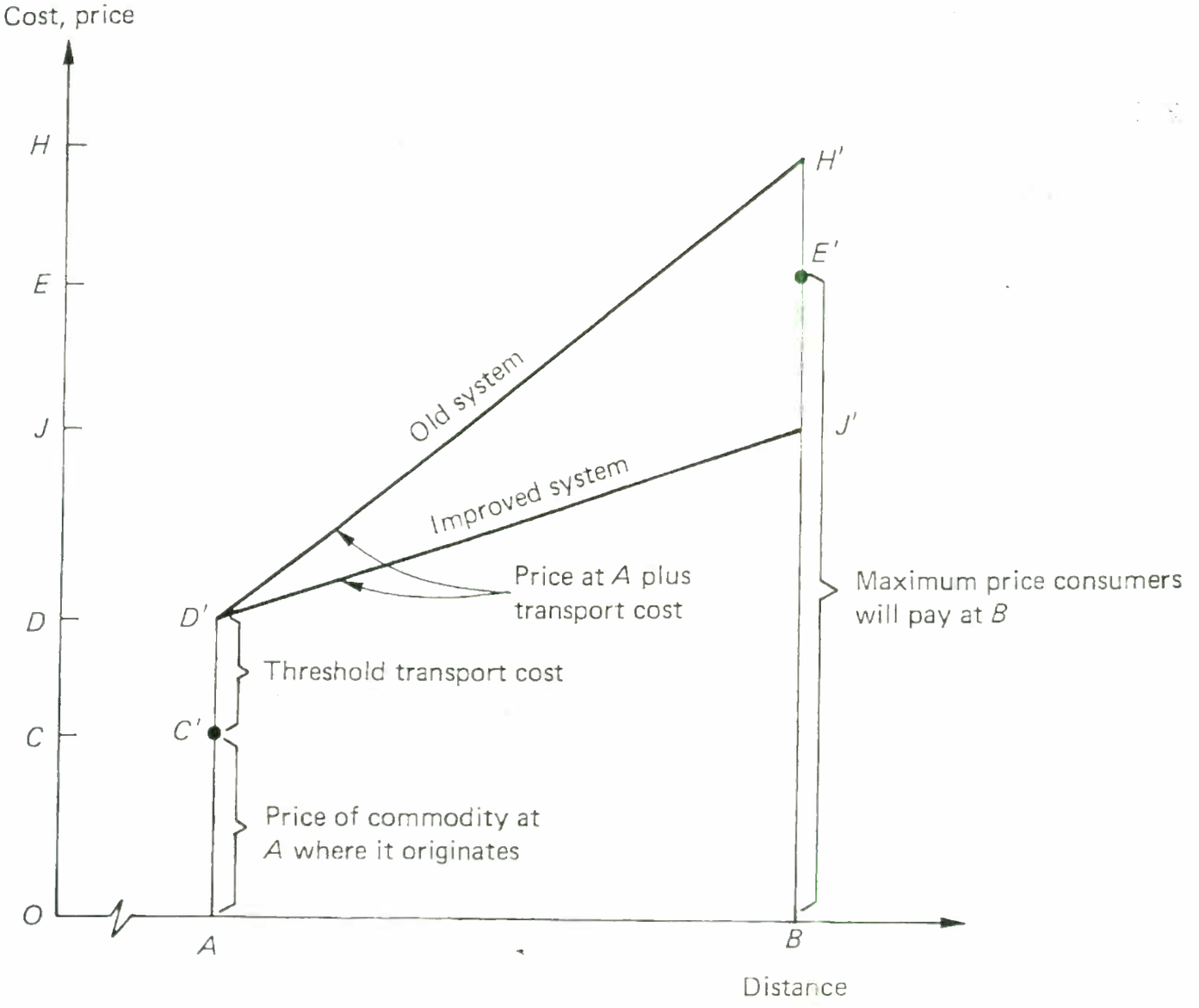
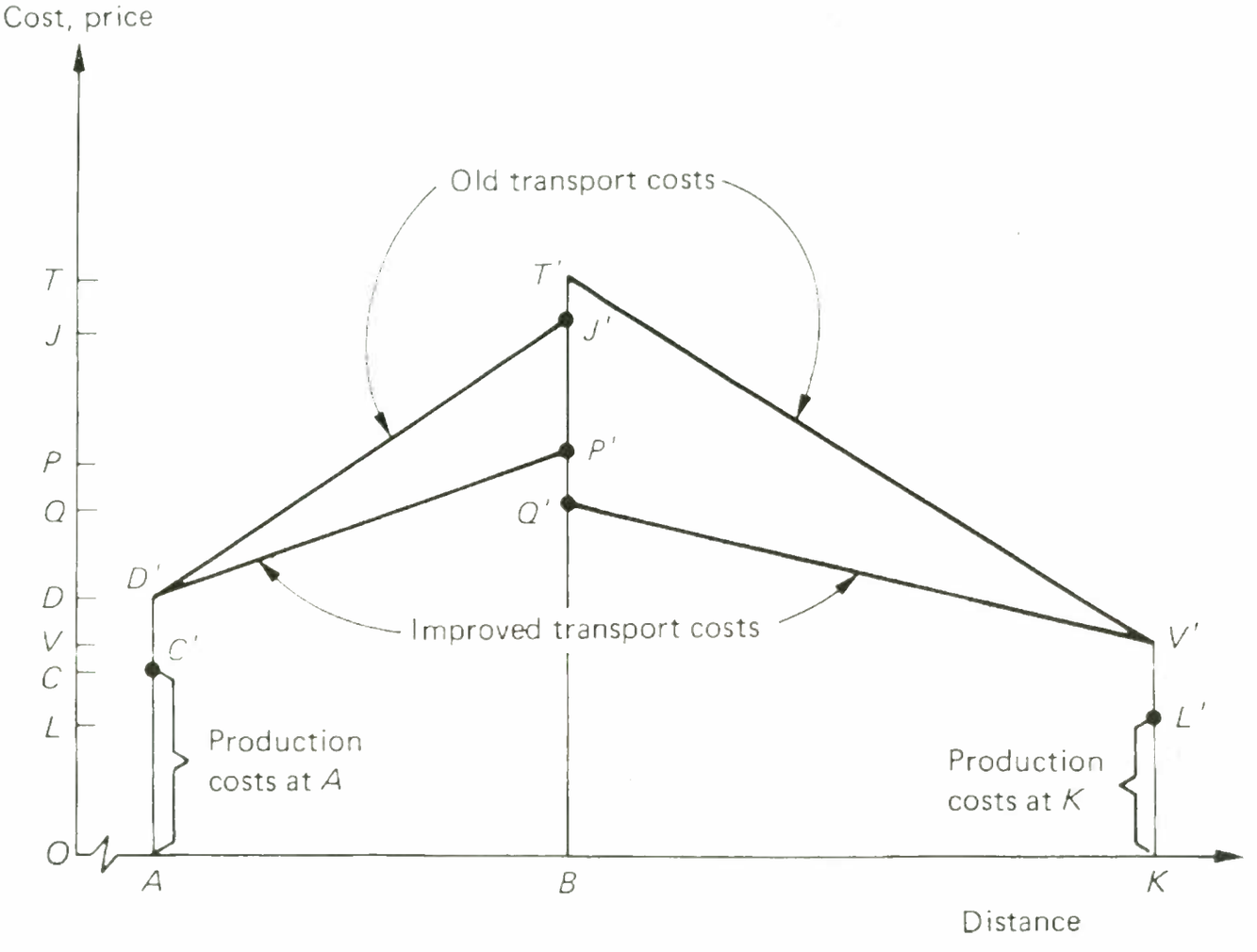
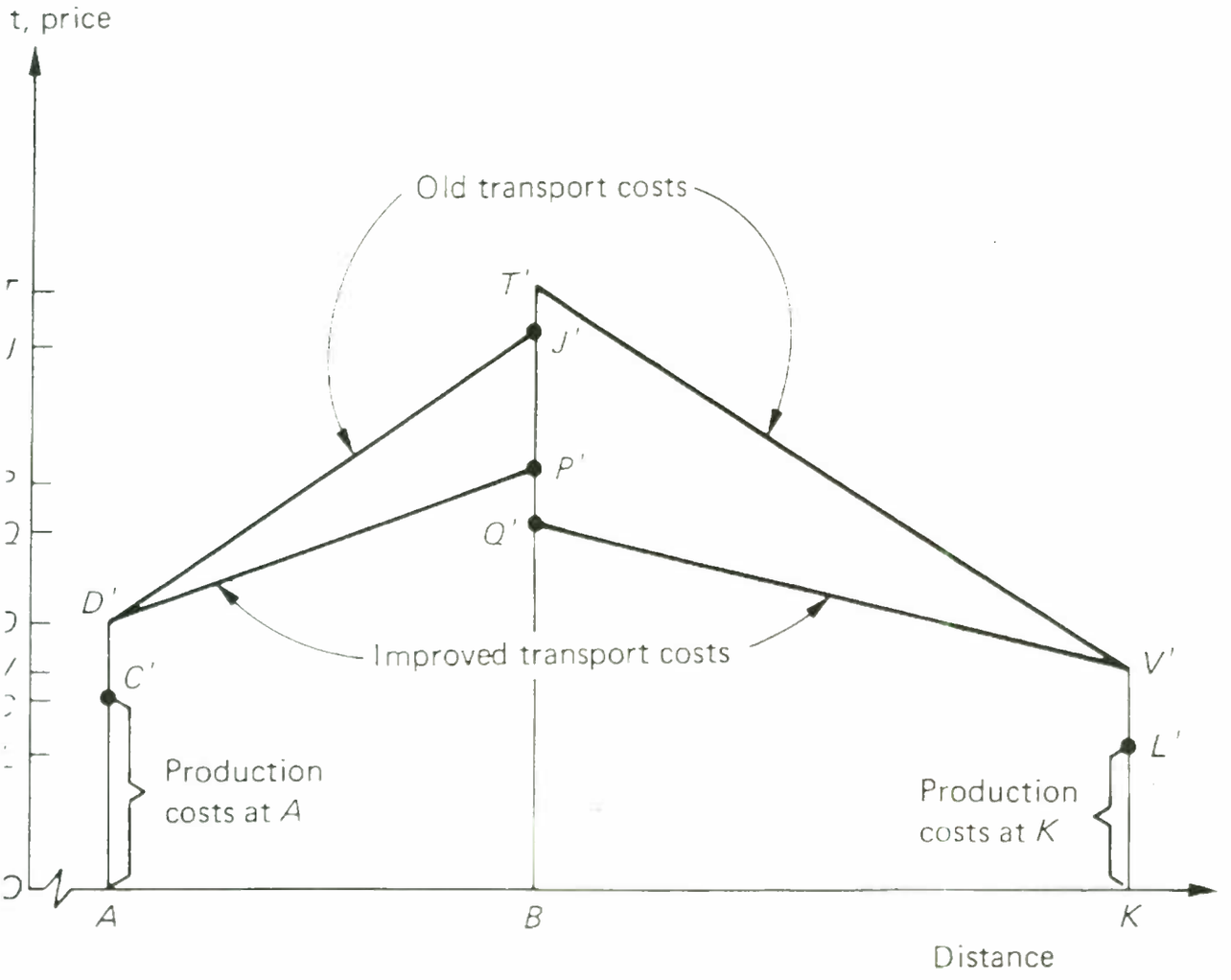


Figure 2-4 **Differential effects of transport improvements on two production centers.**



fferential effects of transport improvements on
o production centers.



D. P model for Infrastructure Investment Analysis

Let T = Planning Horizon

I^t = Investment cost for any time period

m^t = Maint- " " " " "

z^t = Shipping cost " " " "

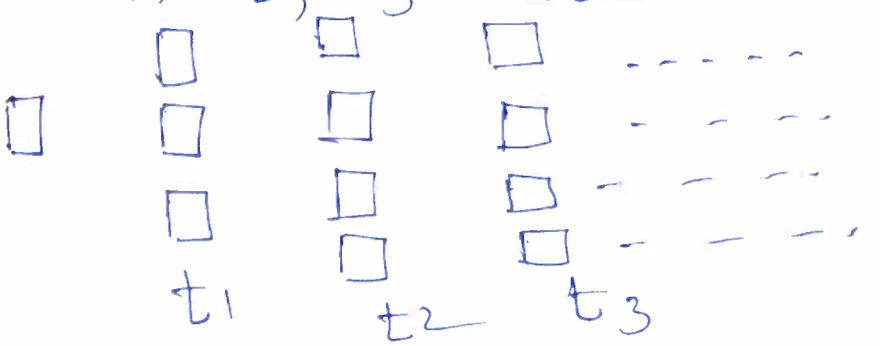
S^T = Scrap value after overall planning period

R_{min} = Overall accumulated cost

N_i^t = Network during period 't' among a set of possible future networks

$M^t(N_i^t)$ = the maint. cost of network existing at time 't'

D_1, D_2, D_3 are discount factors



Now we formulate/see that R_{min} is given by :

$$R_{min} = \sum_{t=0}^{T} (I^t + m^t + z^t) - S^T \quad \ldots(1)$$

$I(t, t+1)$ = Investment between period 't' & 't+1'

Now this formulation must be converted into the same base year with discounting

$$R_{min} = \sum_{t=0}^{T} \Big(\big[I^{(t,t+1)} \cdot N_1^t \cdot D_1 \big] + \cdot m^t(N_i^t) \cdot D_2 + z^t(N_i^t) D_2 \Big) - S^T(N_i^t) \cdot D_3$$

And the Recursive model is given as

$$R^{*\,t+1} = \big[R^{*t} + R^{(t,t+1)} \big]$$

That completes the formulation of D.P model for Infrastructure Investment planning