

Figures in *Forest Economics*

prepared by Daowei Zhang

To accompany *Forest Economics* by
Daowei Zhang and Peter H. Pearse
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Figure 1.1: A forest's economic value

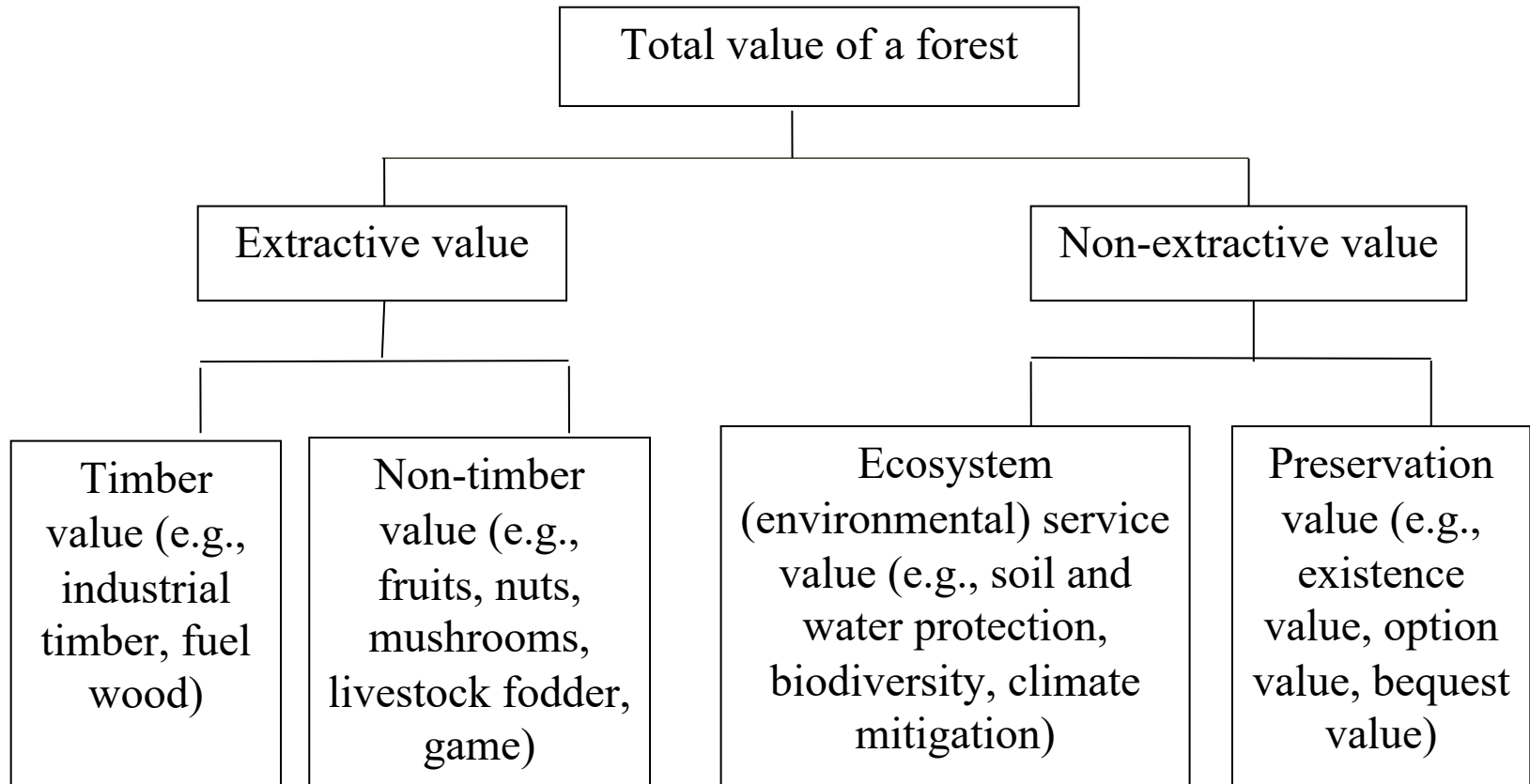


Figure 2.1a: Relationship between output and inputs

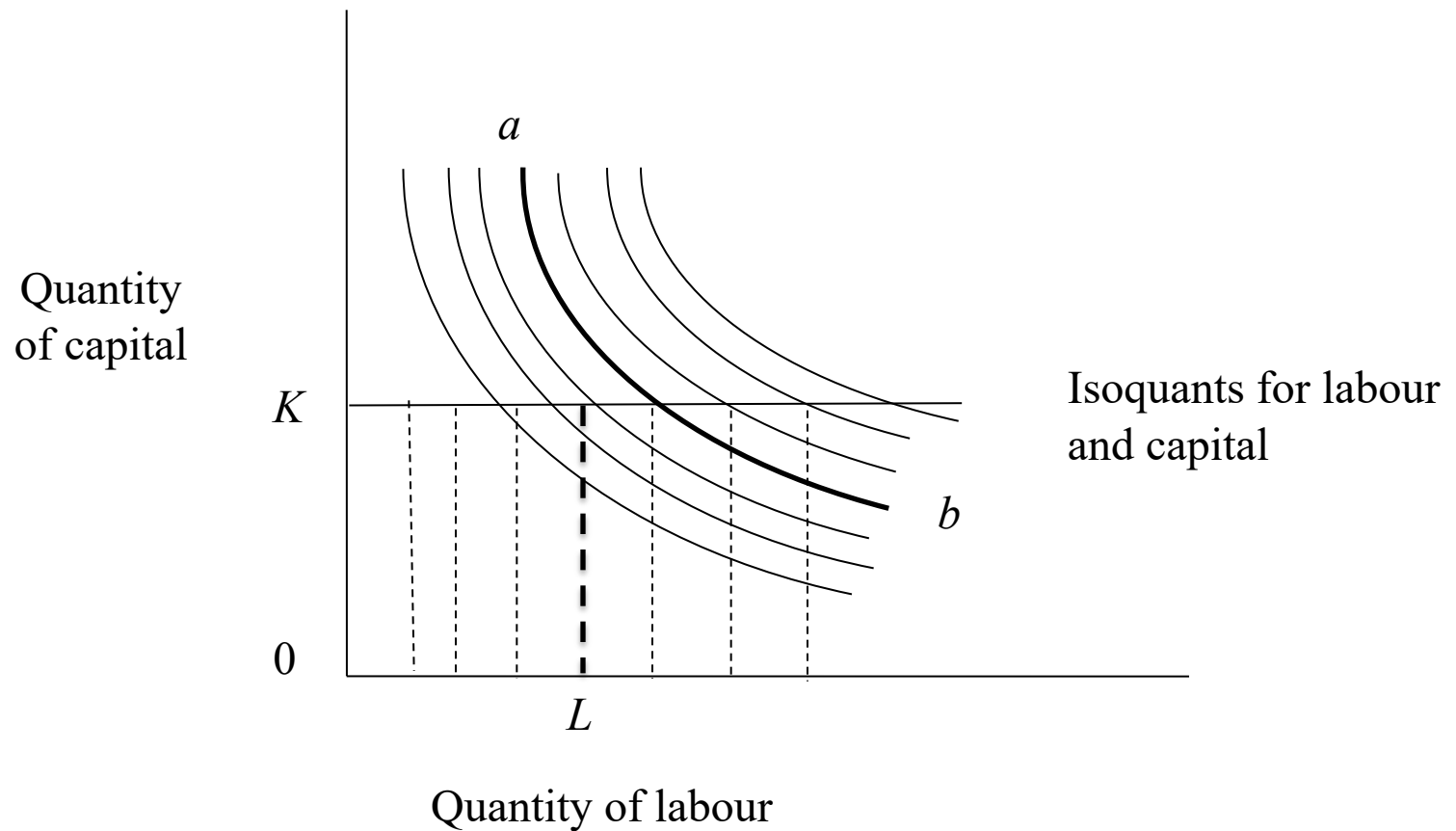


Figure 2.1b: Relationship between output and labour

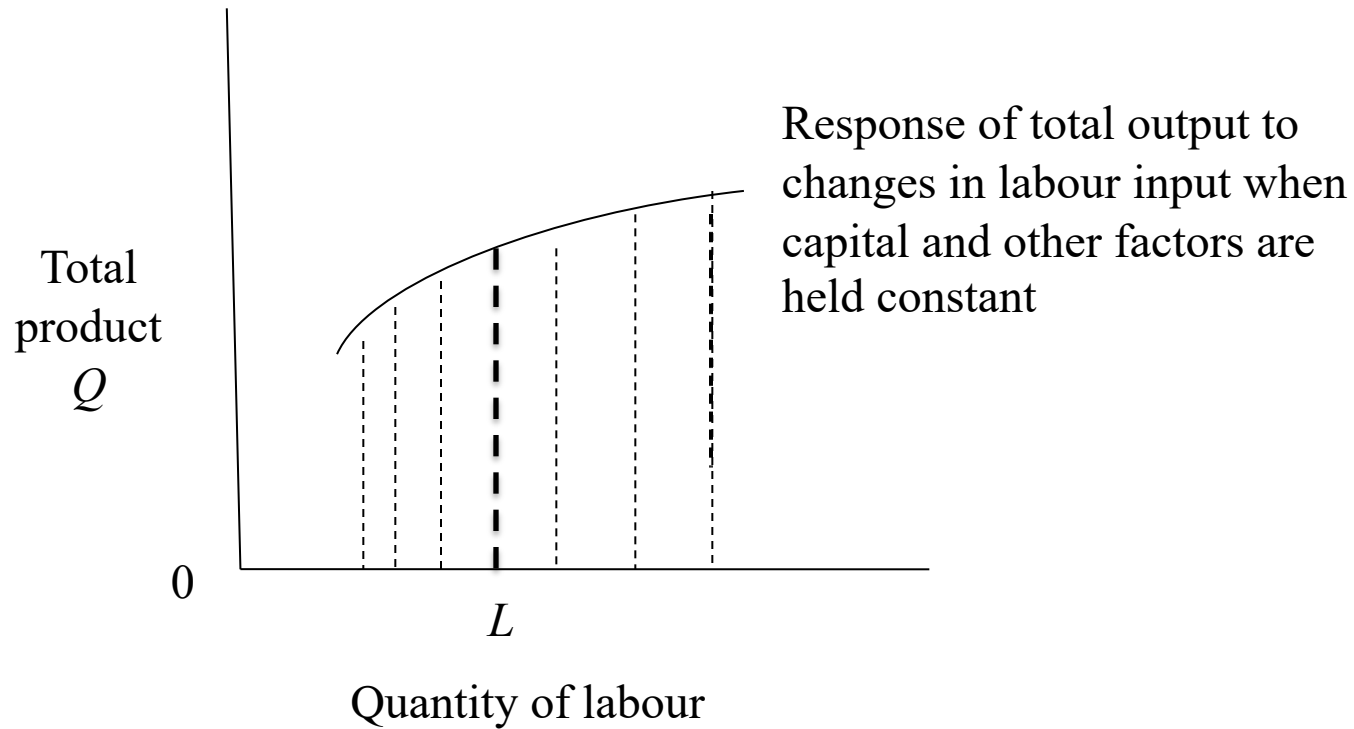


Figure 2.1c: Relationship between output and labour: Law of diminishing marginal products

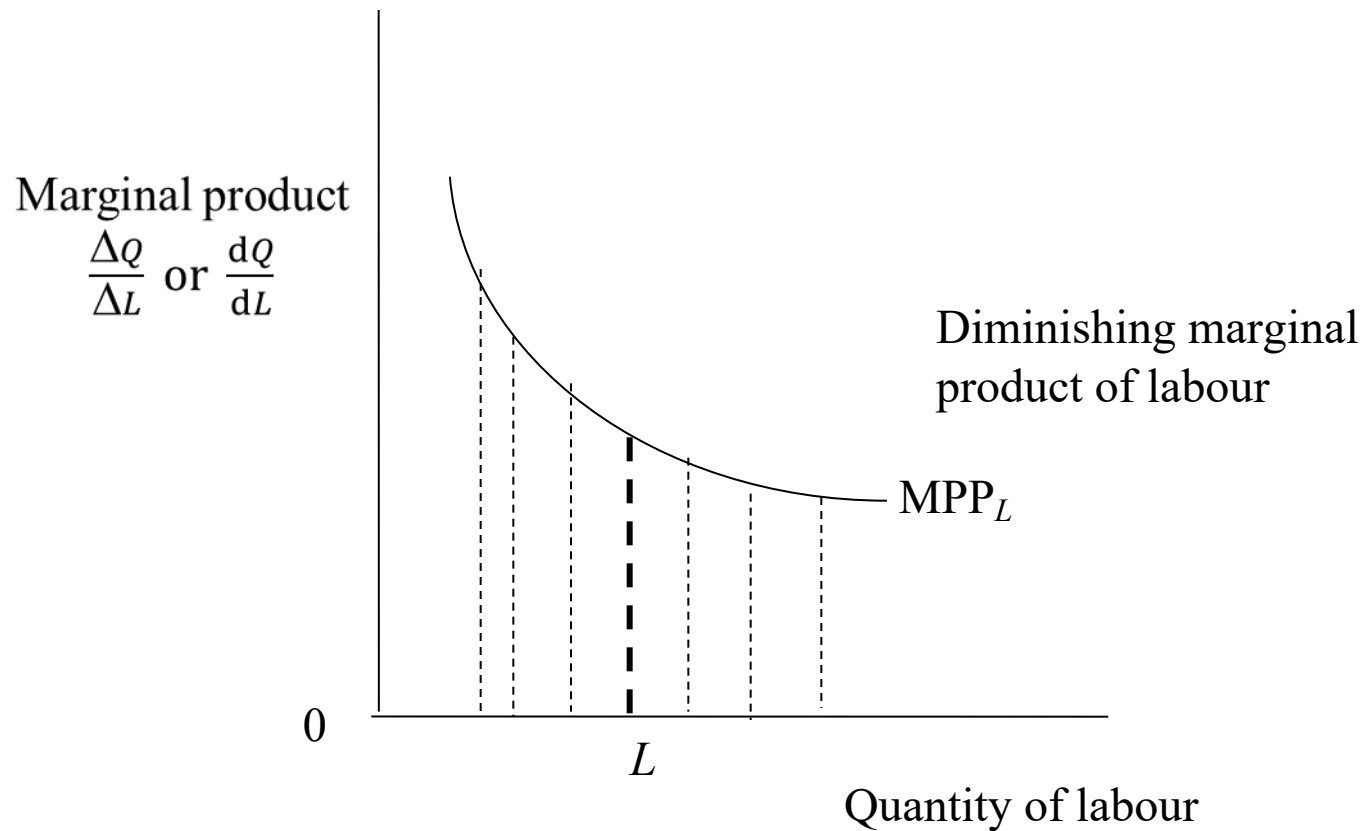


Figure 2.1: Relationship between output and inputs

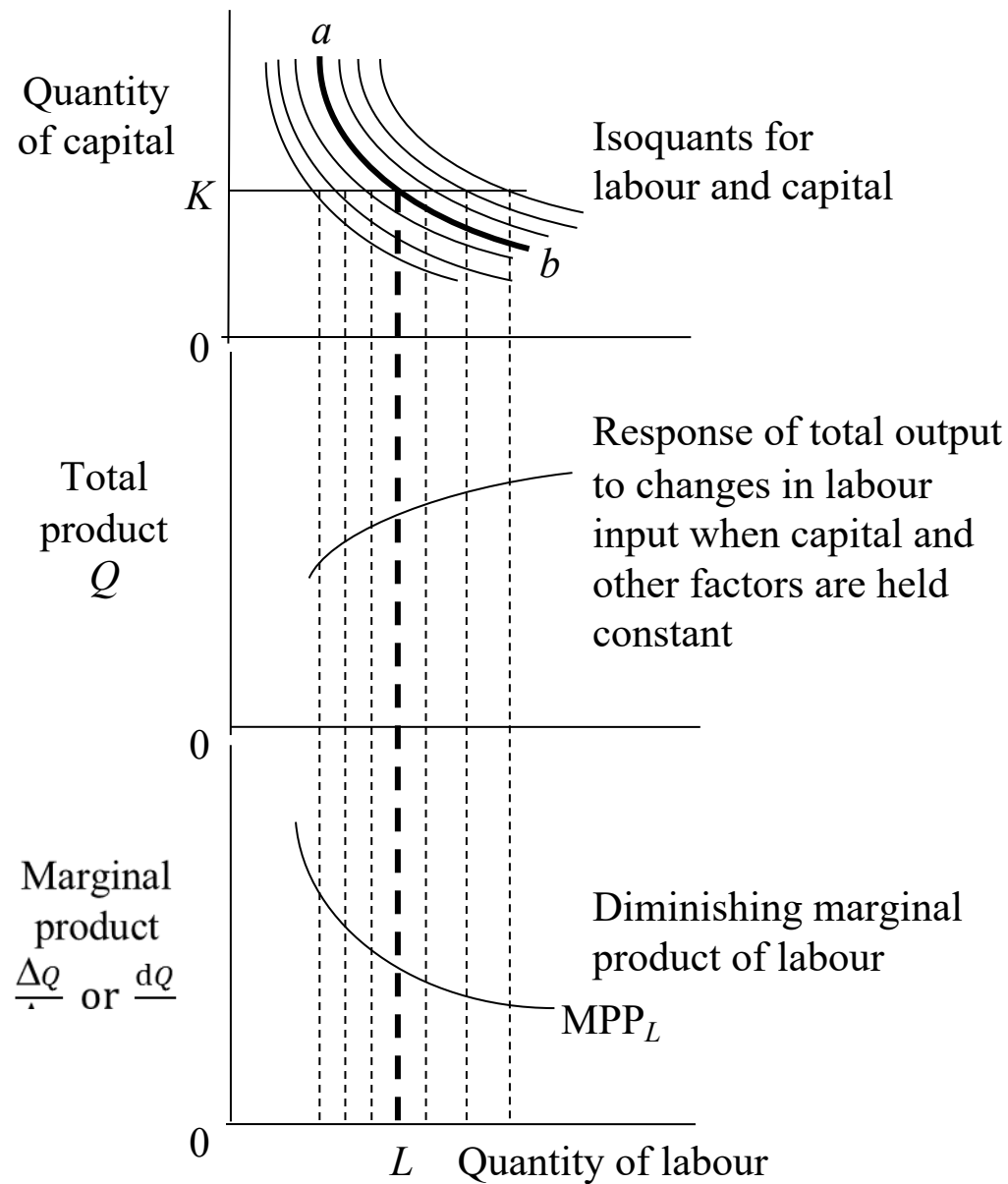


Figure 2.2: Isocost curve for capital and labour



Figure 2.3: Expansion path of efficient input combinations

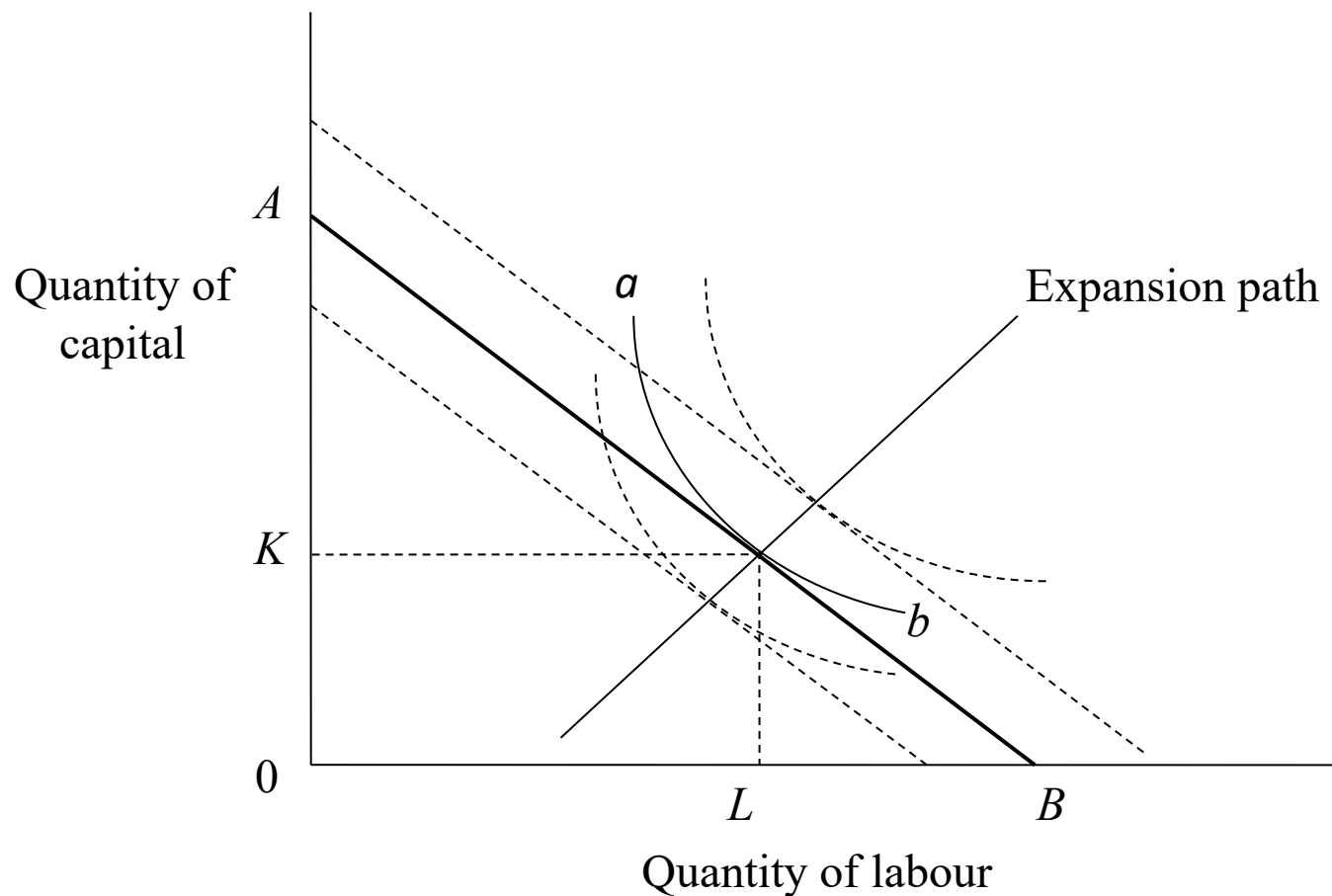


Figure 3.1: Decision tree for a pest control project

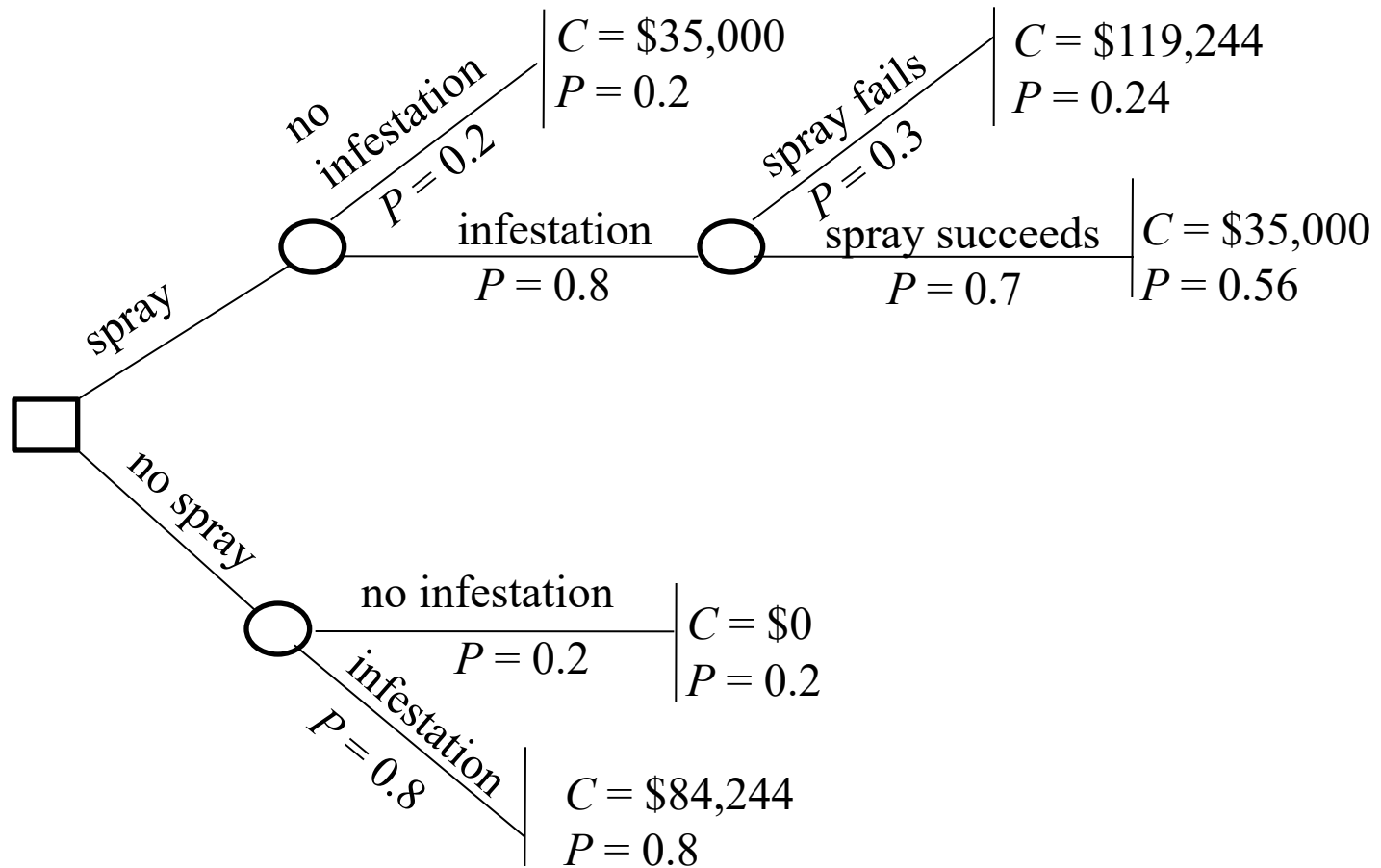


Figure 3.2: Correct and incorrect match of interest rate and timber price in forest investment analysis

	Real price	Nominal price
Real interest rate	√	× (inflates the returns of forest projects)
Nominal interest rate	× (biased against forest projects)	√

√ = correct match, × = incorrect match.

Figure 3.3: Value of a pre-merchantable loblolly pine timber stand: Difference between discounting at age 30, when the stand is ready for a final harvest (valued at B), and at age 15, when the stand just becomes merchantable (valued at A)

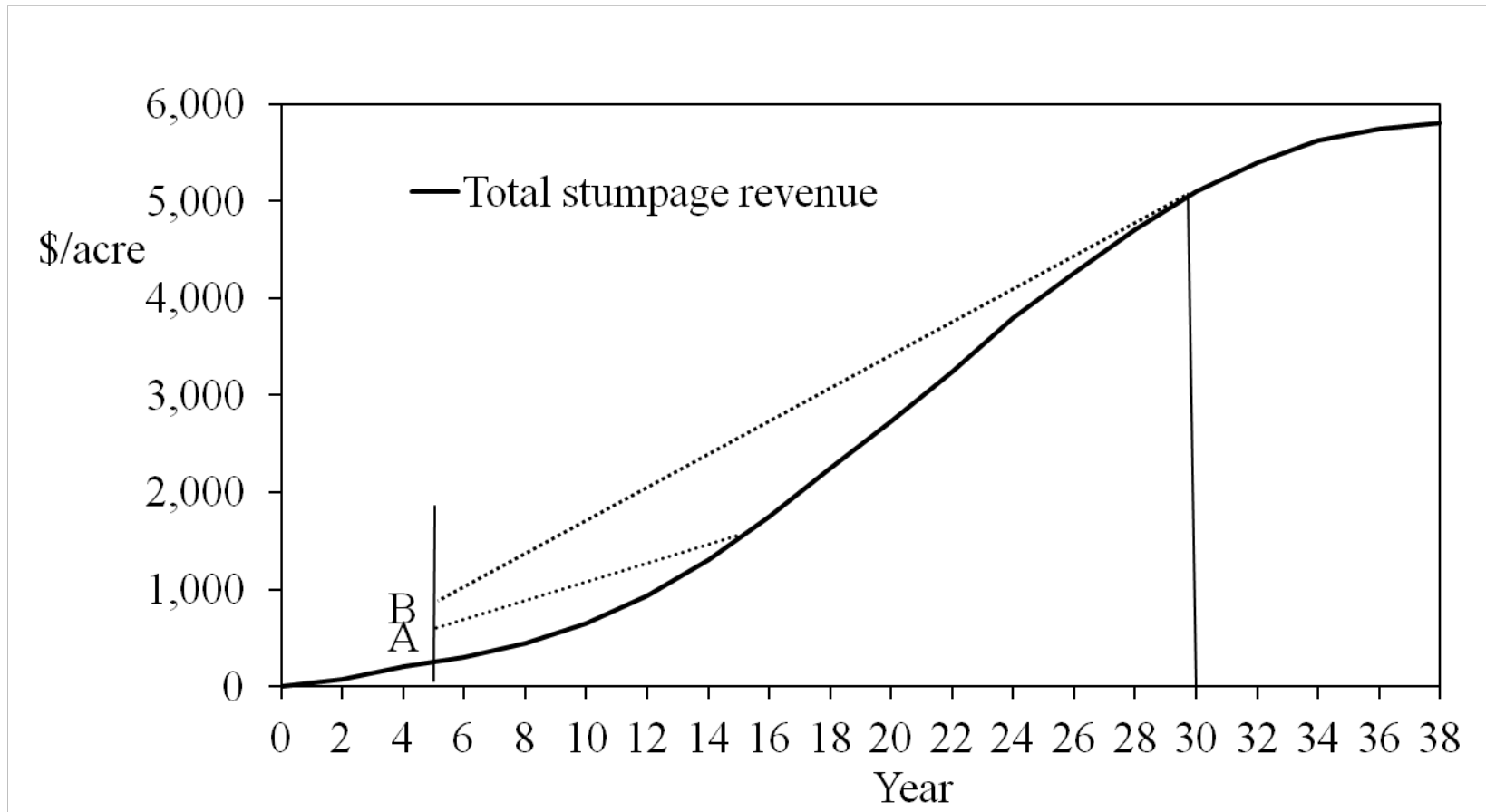


Figure 4.1: Market supply, demand, and net value of a forest product

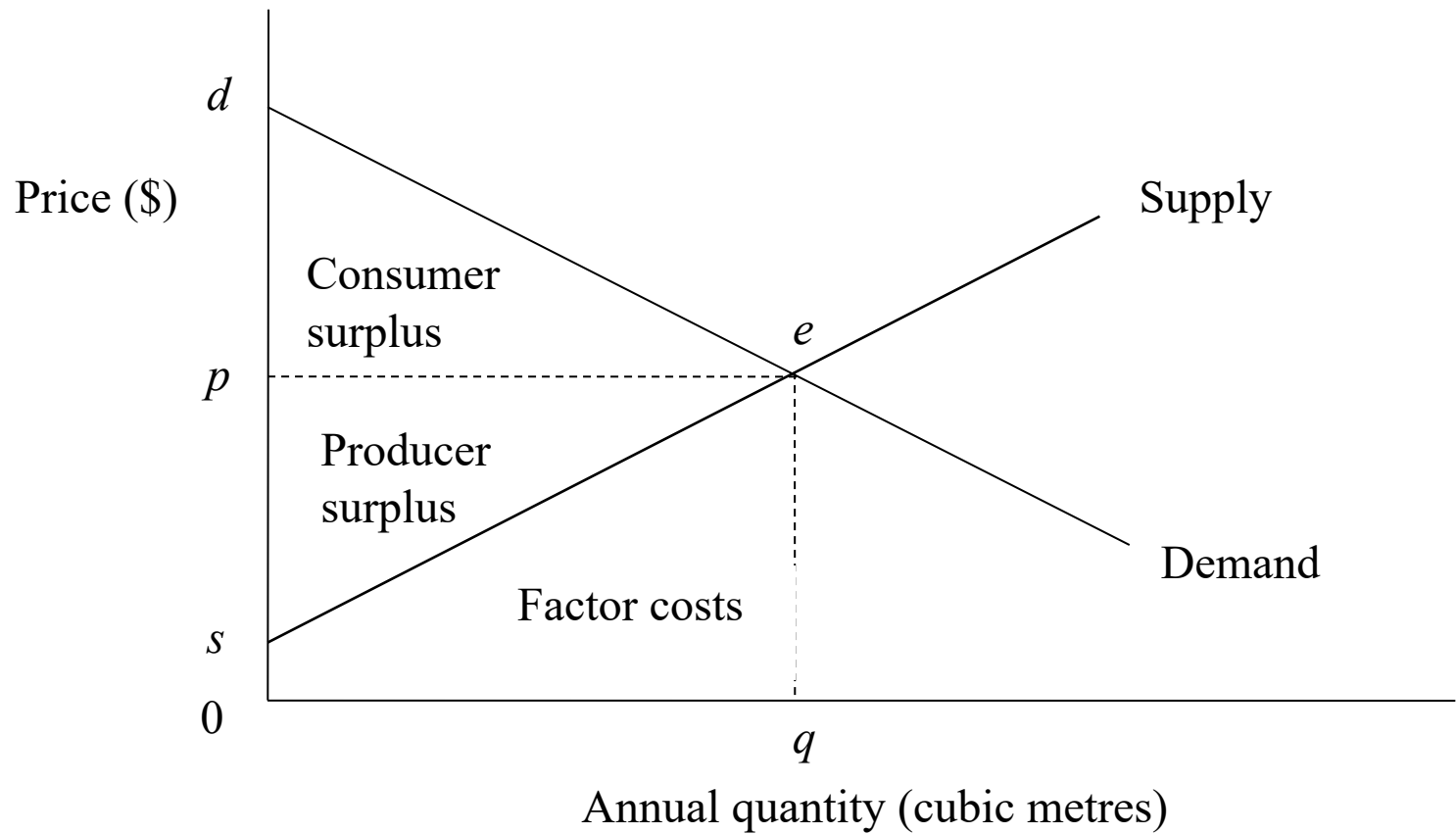


Figure 4.2: Relative elasticity and welfare change resulted from an increase in supply

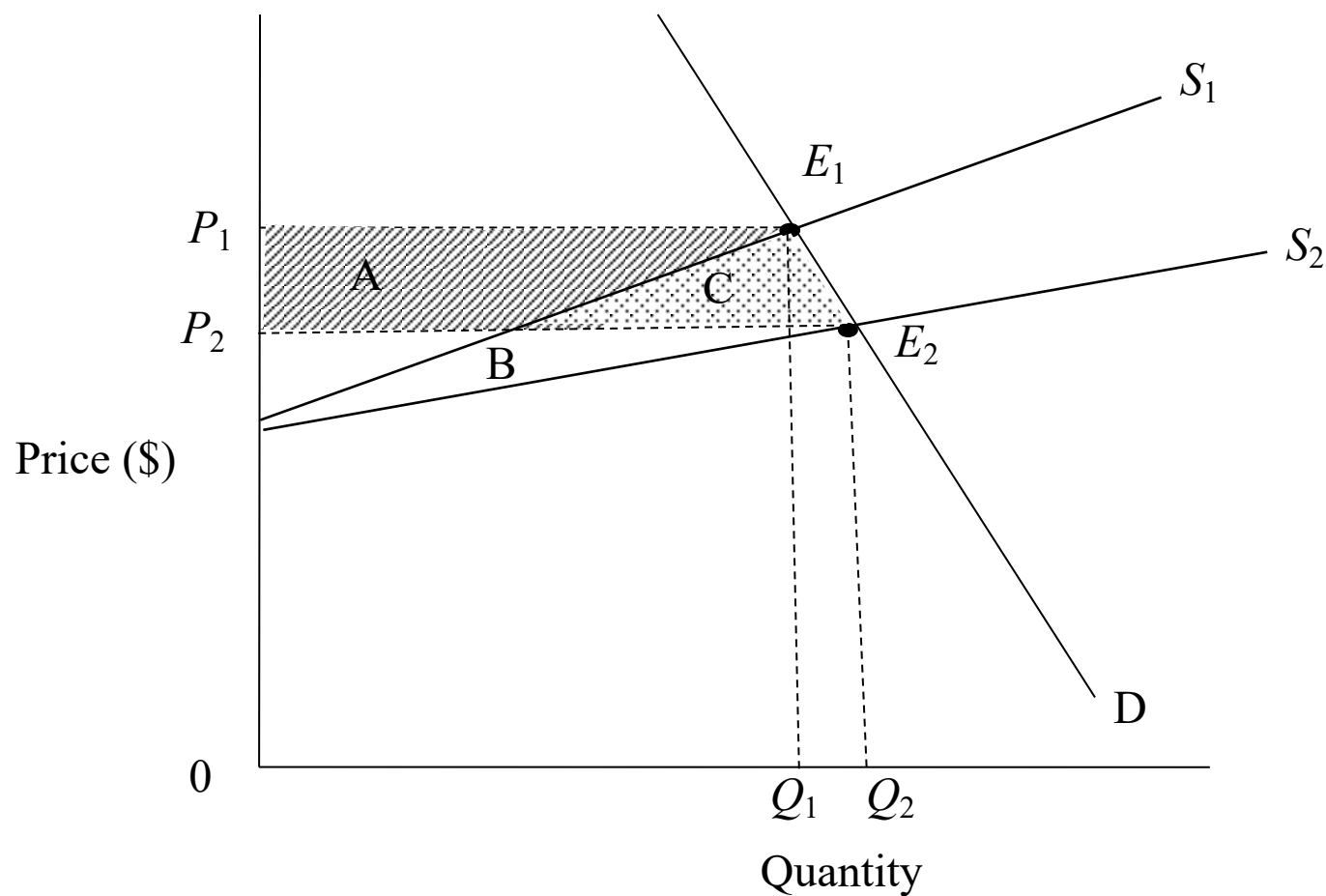


Figure 4.3: Linkage among stumpage, log, and forest products markets

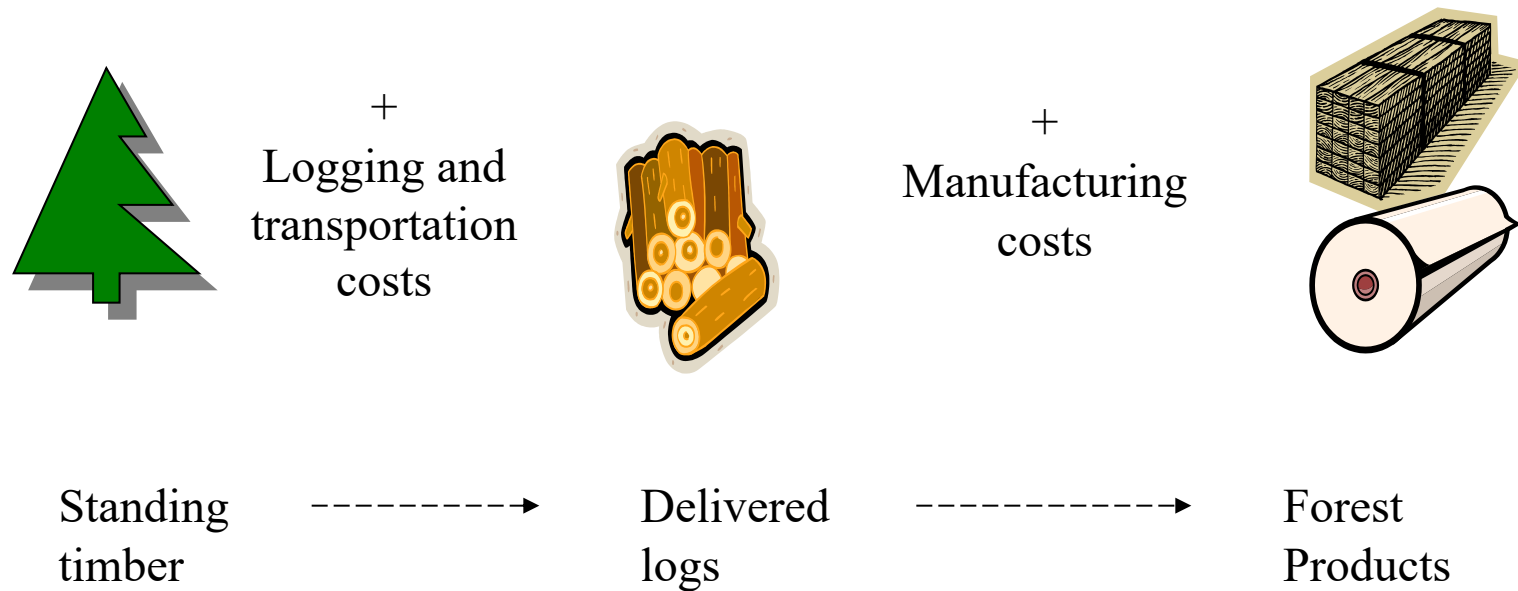


Figure 4.4: Prices for softwood lumber, sawlogs, and sawtimber stumpage in the southern United States: 1955-2001 (MBF = thousand board feet)

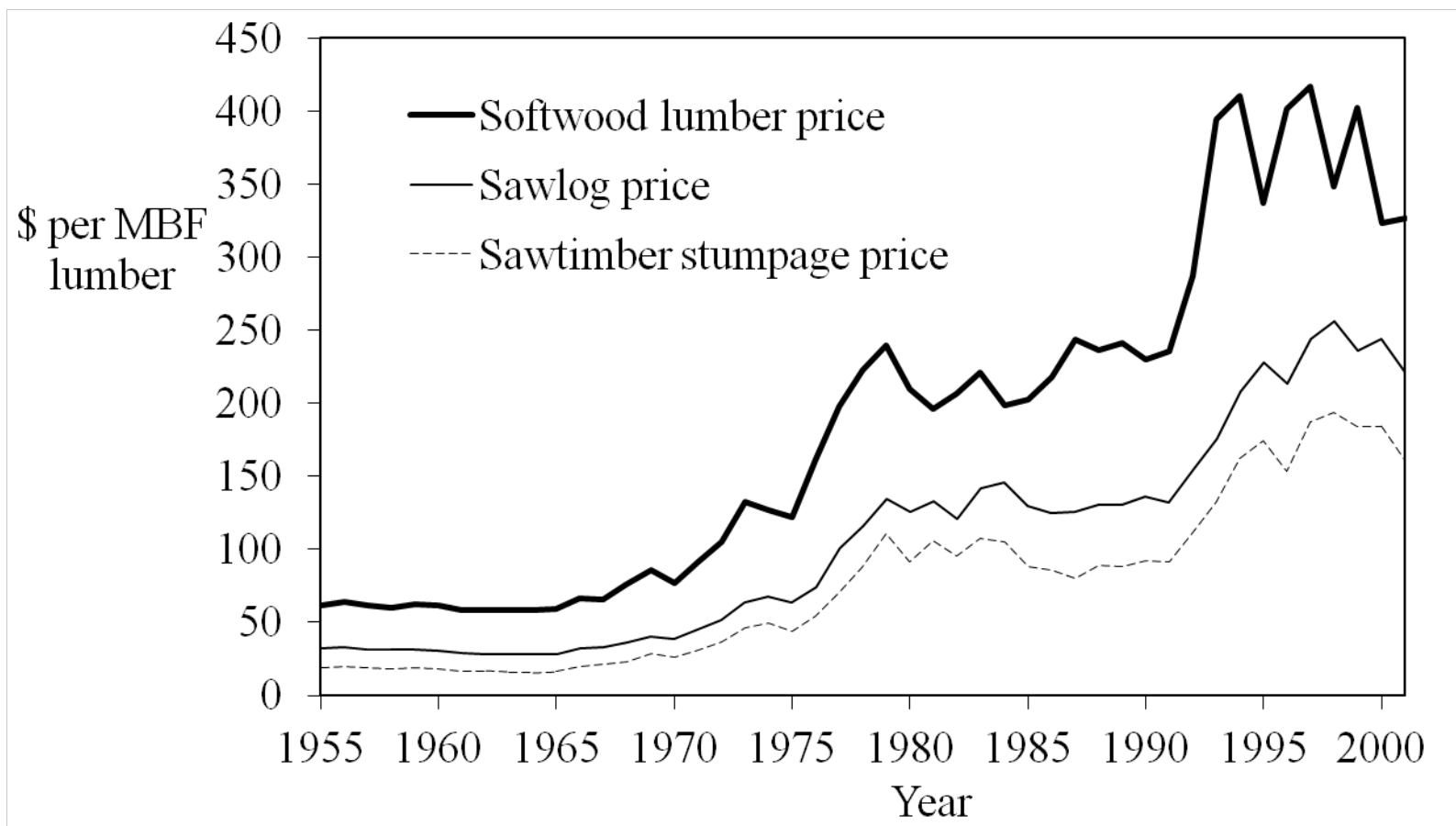


Figure 4.5: Derived demand for pulpwood in newsprint production

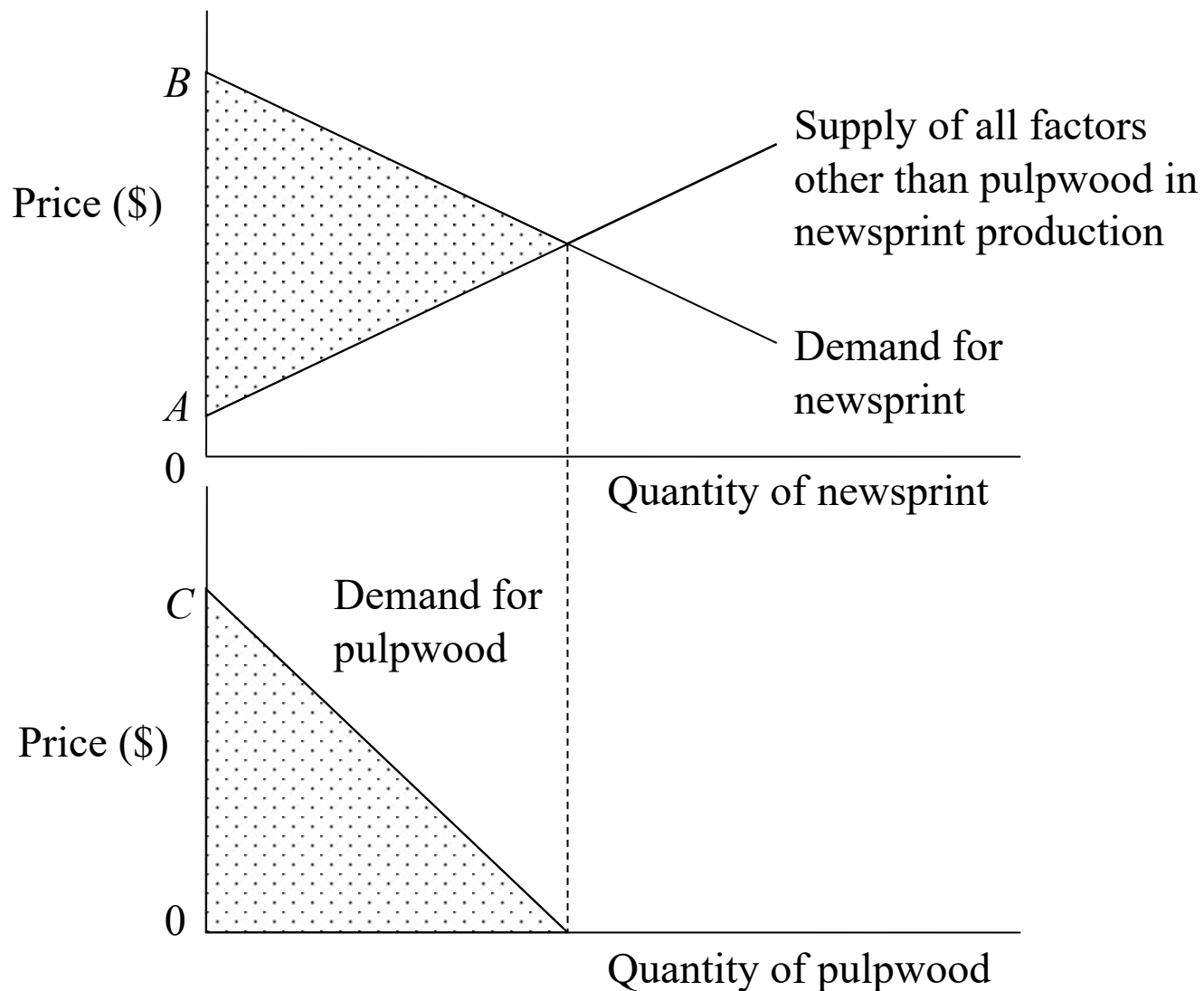


Figure 4.6: Timber demand and supply for timber in short and long-run

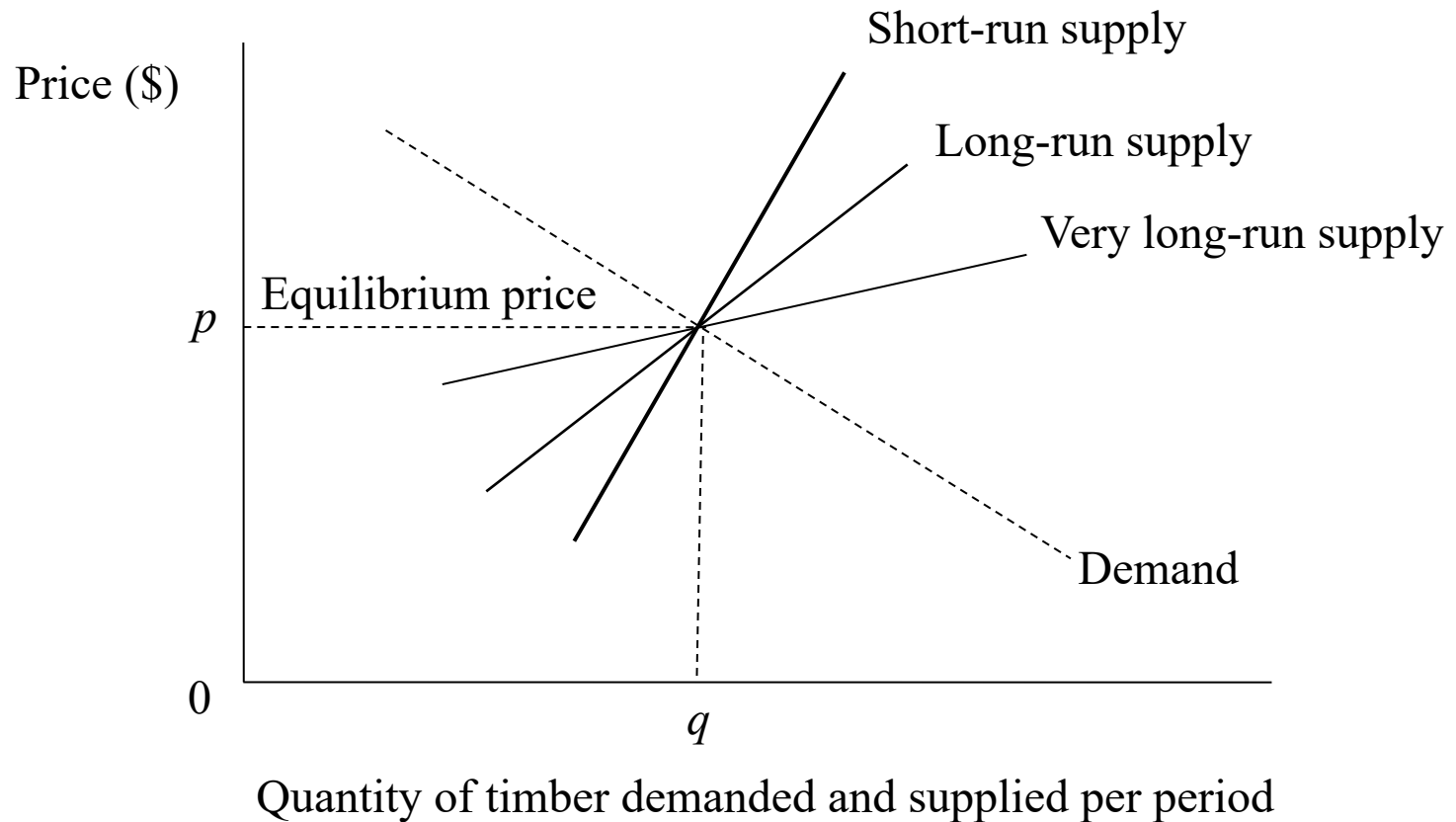


Figure 4.7: Long-run supply response when demand shifts upward

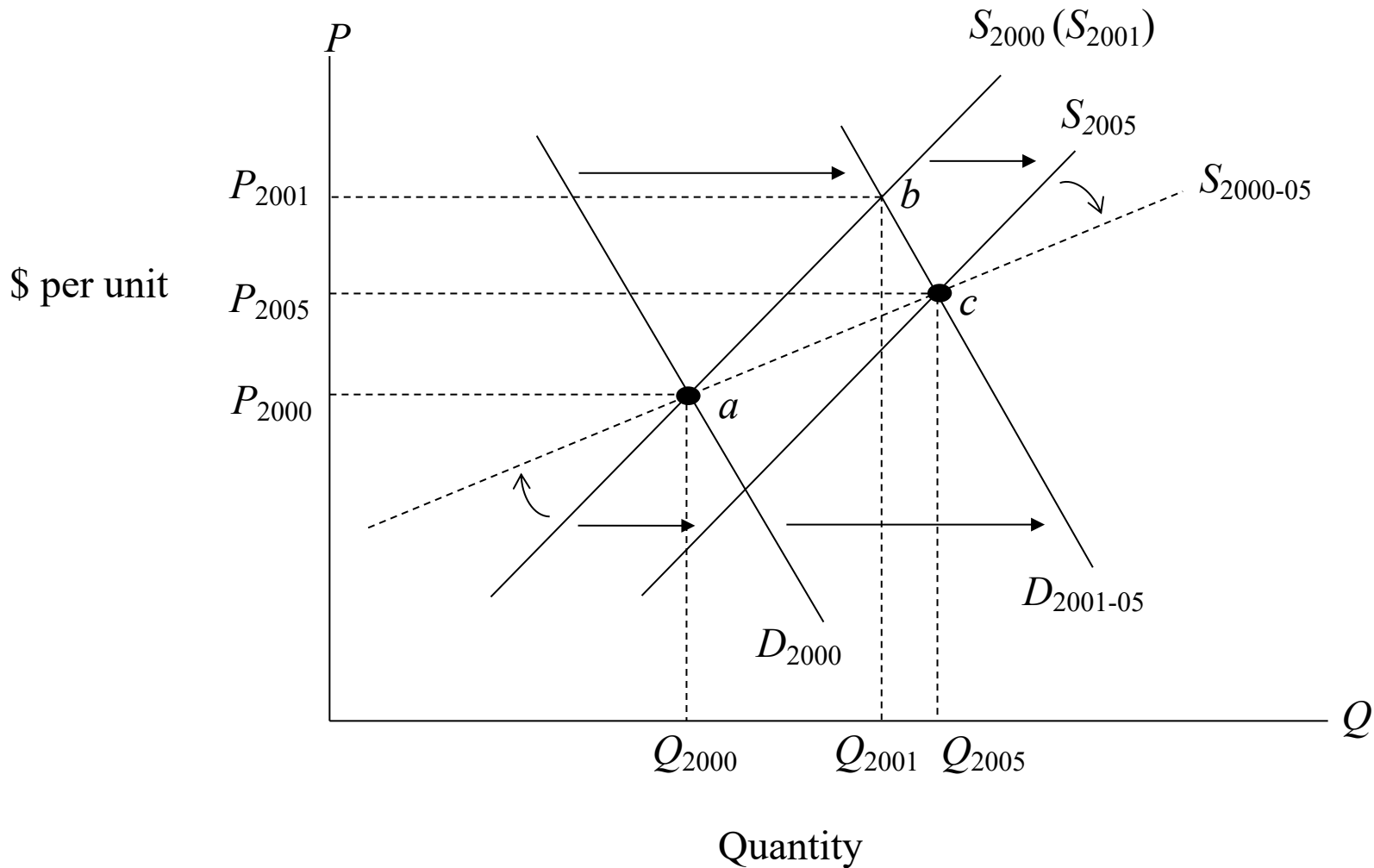


Figure 4.8: Relationship between net value of timber and economically recoverable inventory

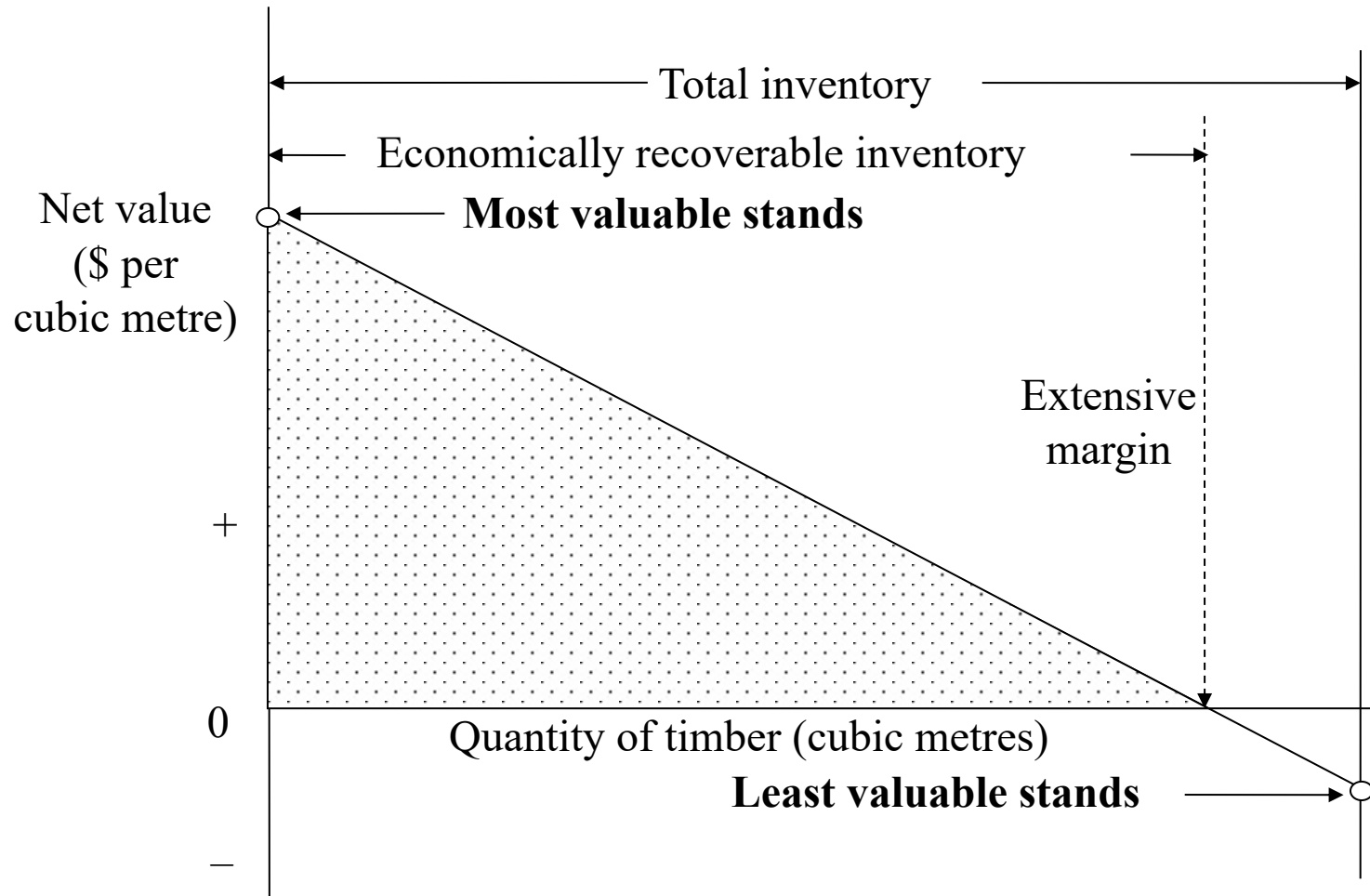


Figure 4.9: Long-run timber supply projection

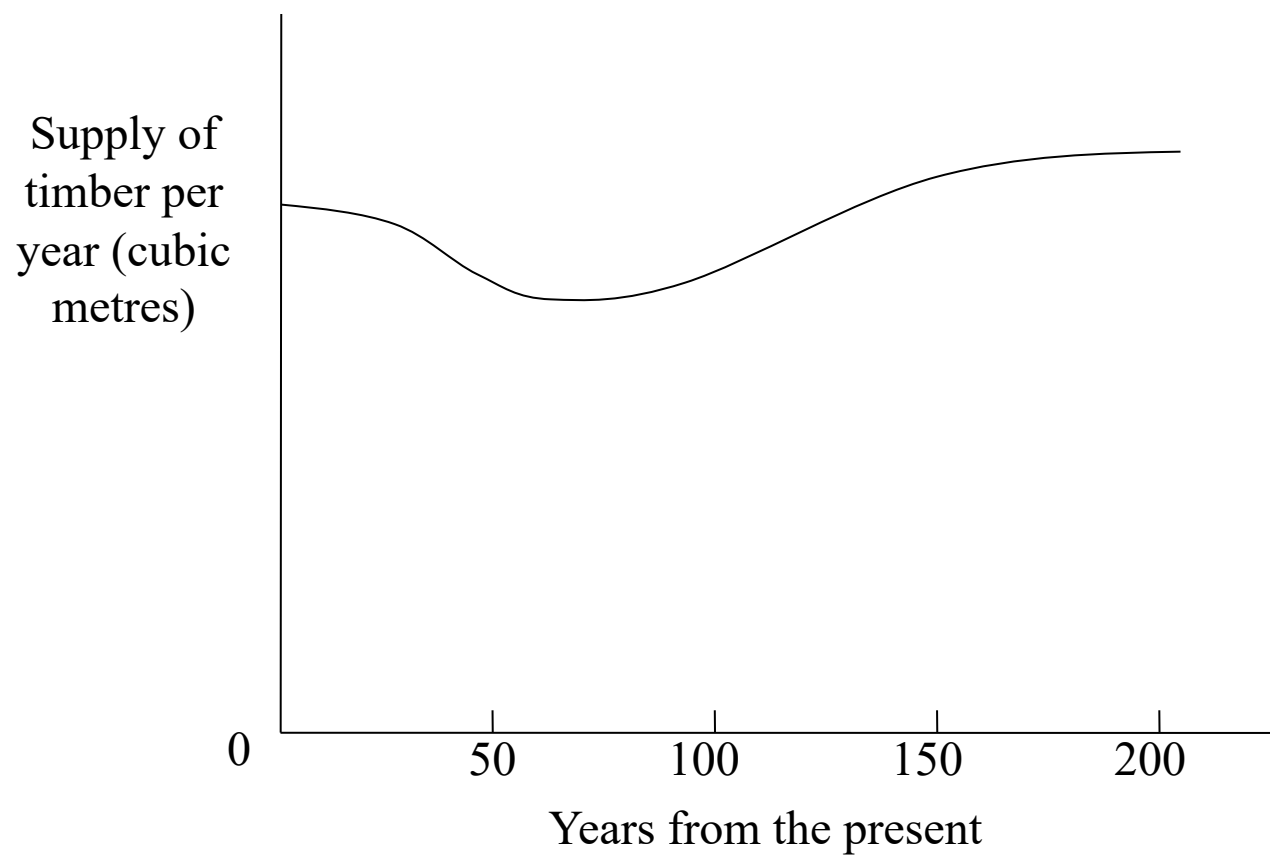


Figure 5.1: Market demand and consumer surplus

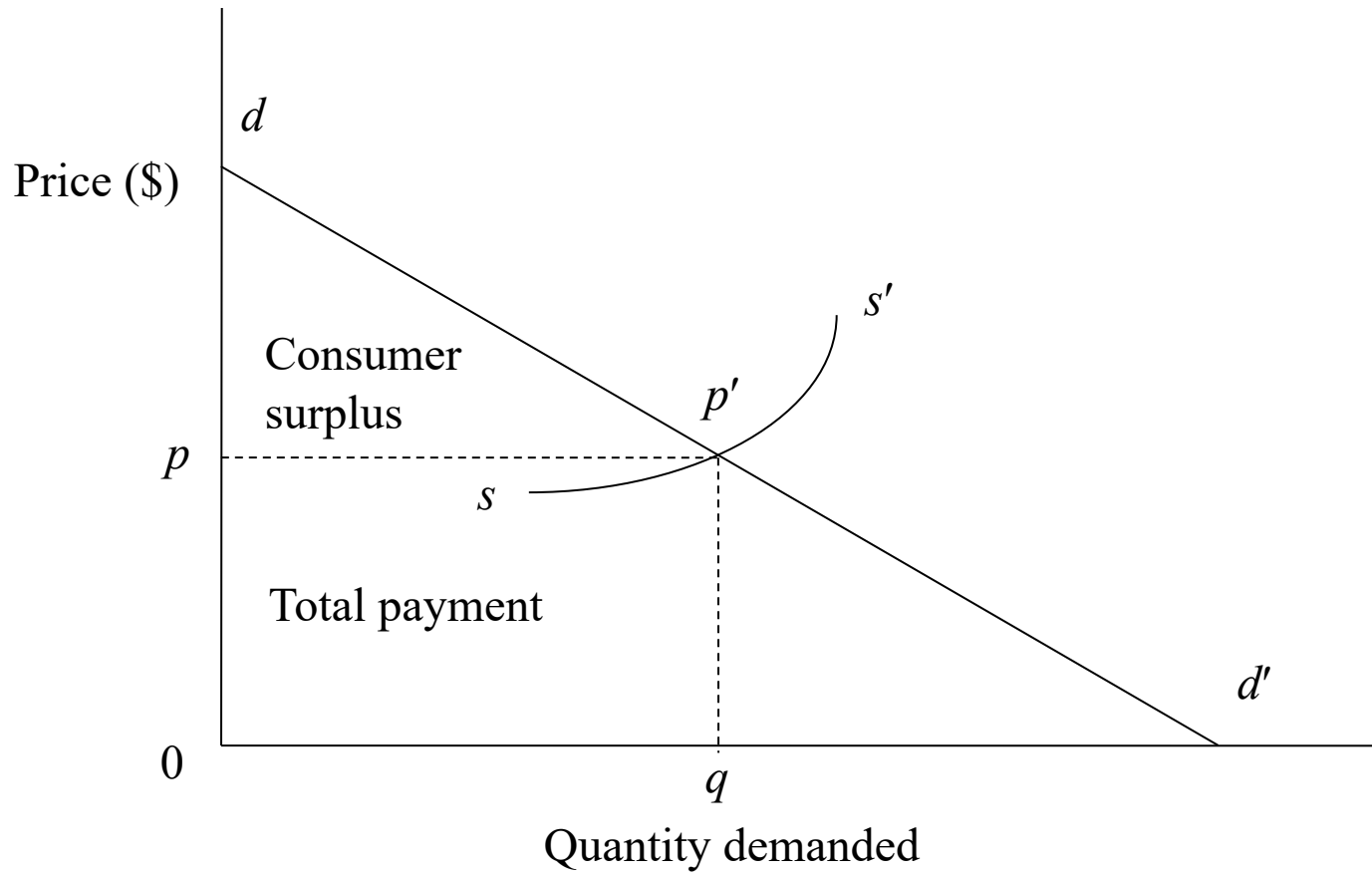


Figure 5.2: Equilibrium level of recreation consumption at two levels of fixed cost

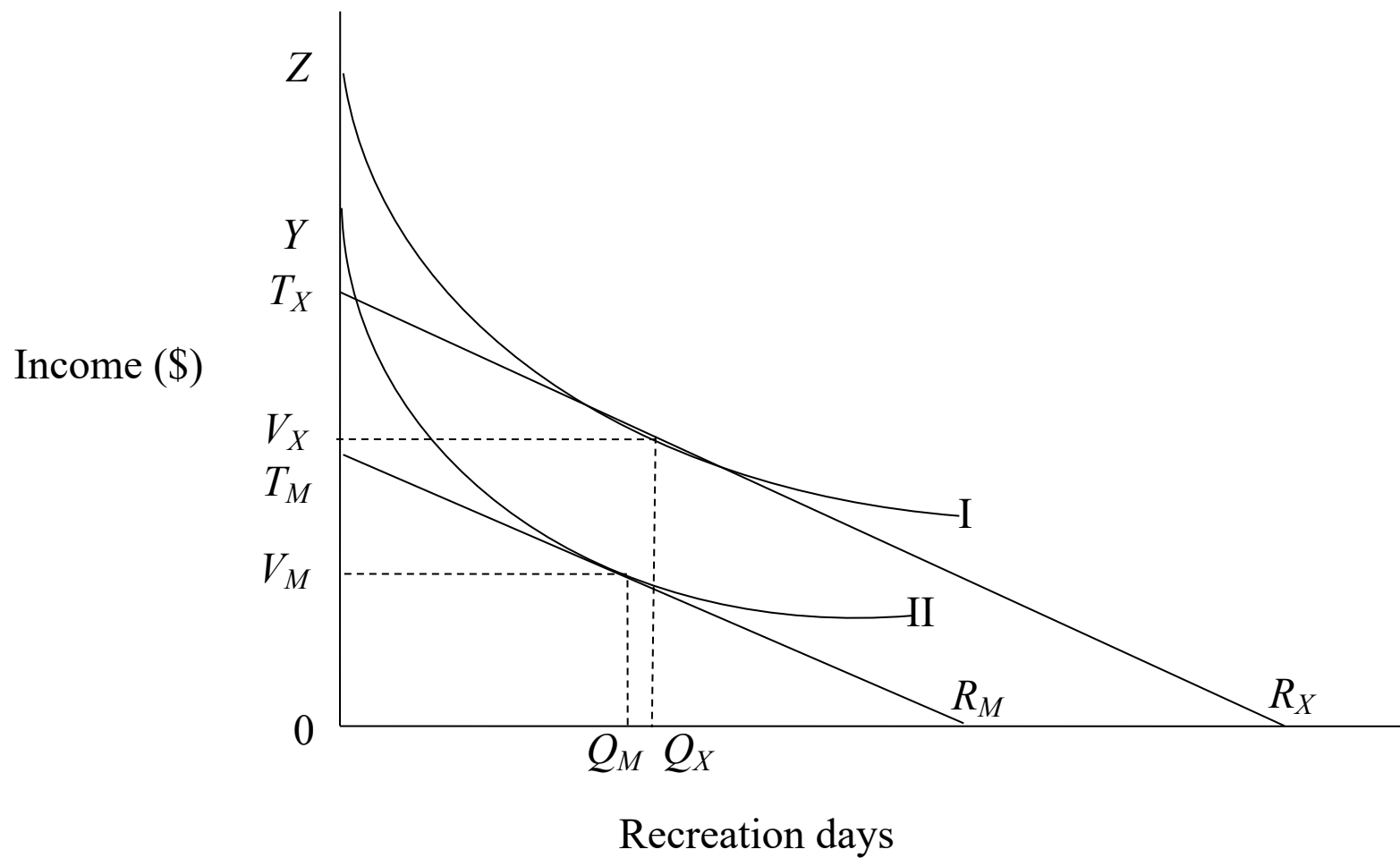


Figure 5.3: Zones of travel origin to a recreational site

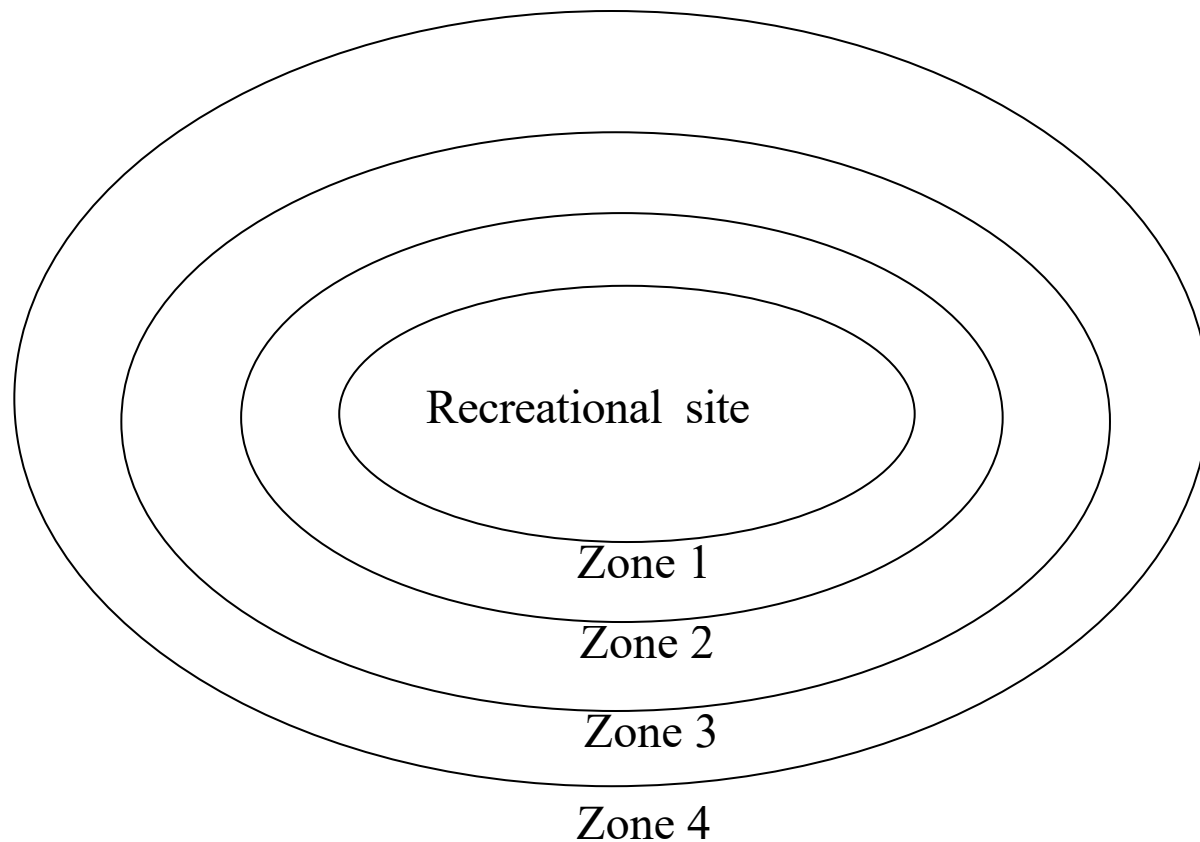


Figure 5.4: Derivation of the demand curve for a recreational site from travel costs

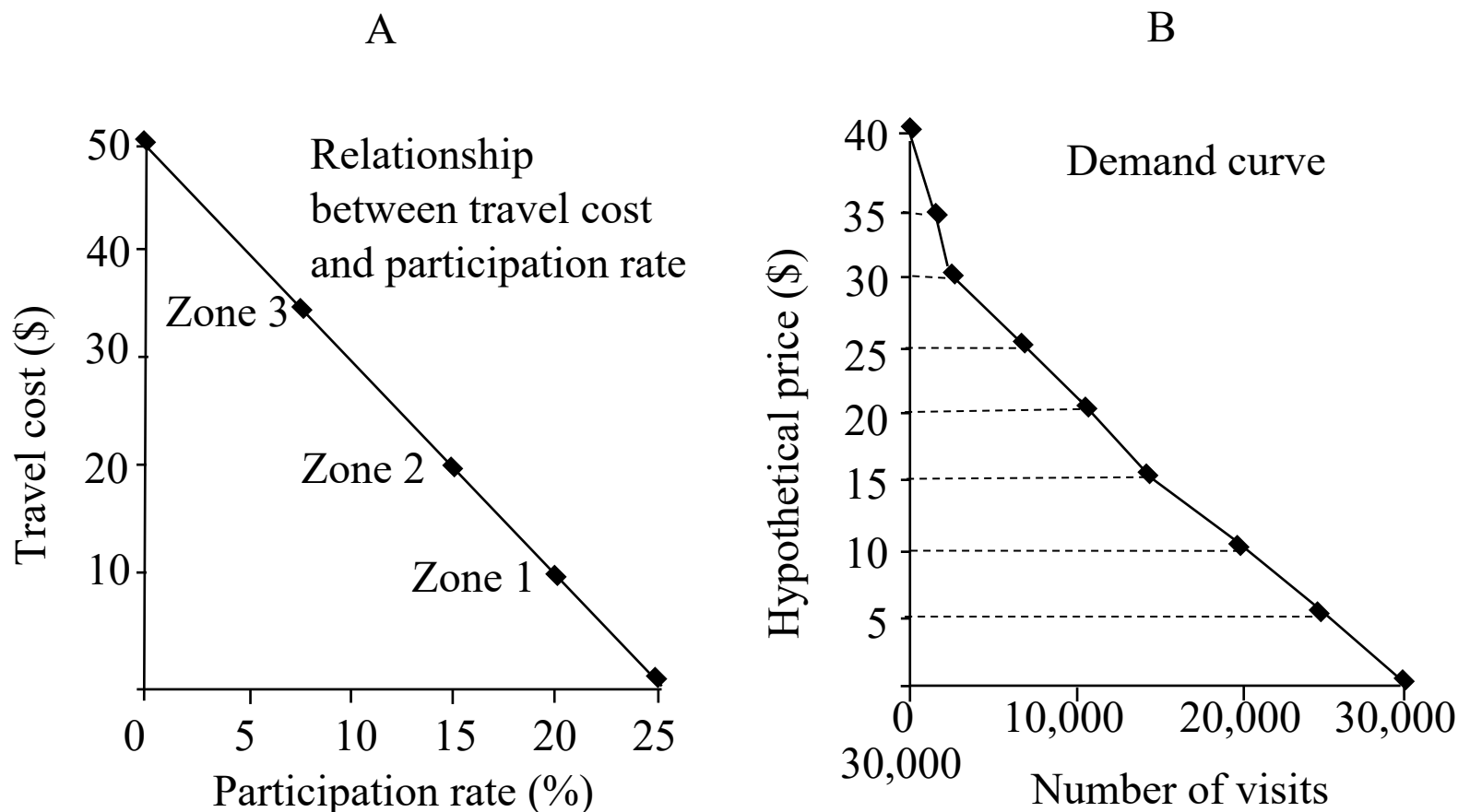


Figure 5.5: Effect of crowding on demand for a recreational opportunity

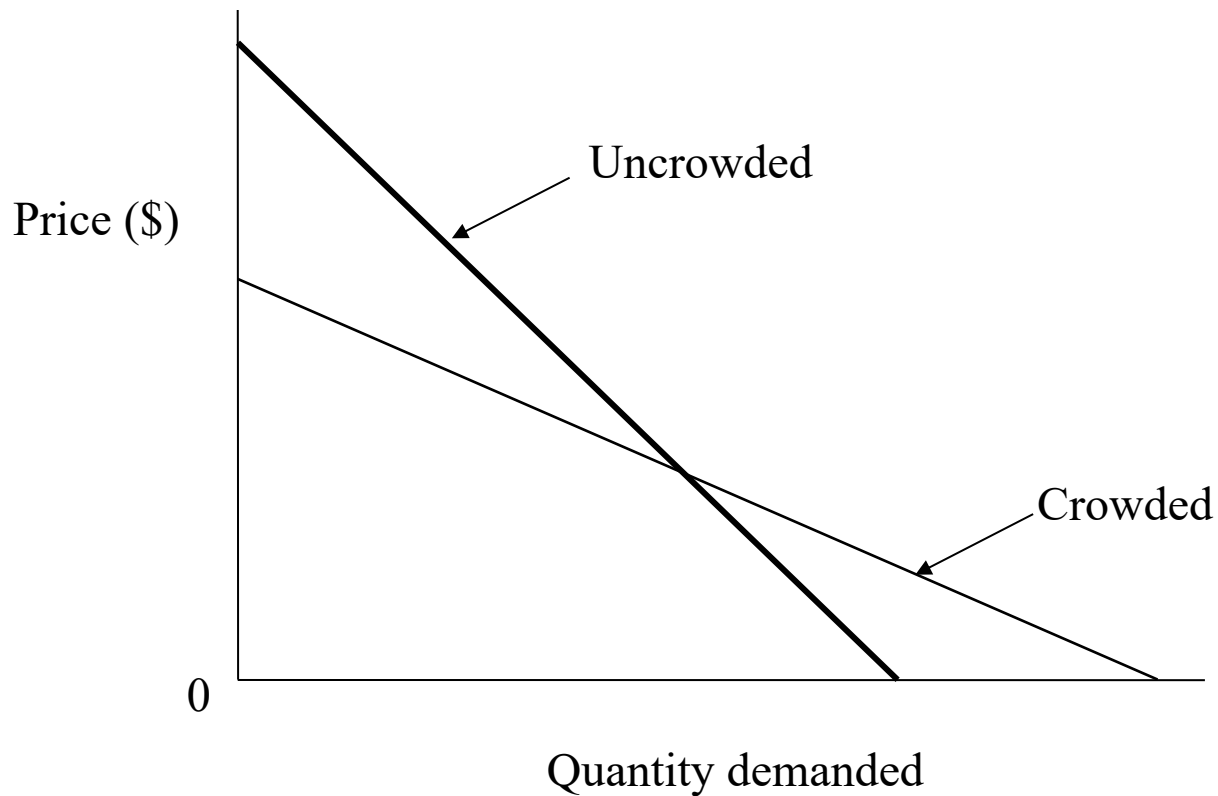


Figure 6.1: Efficient application of labour to a forest site

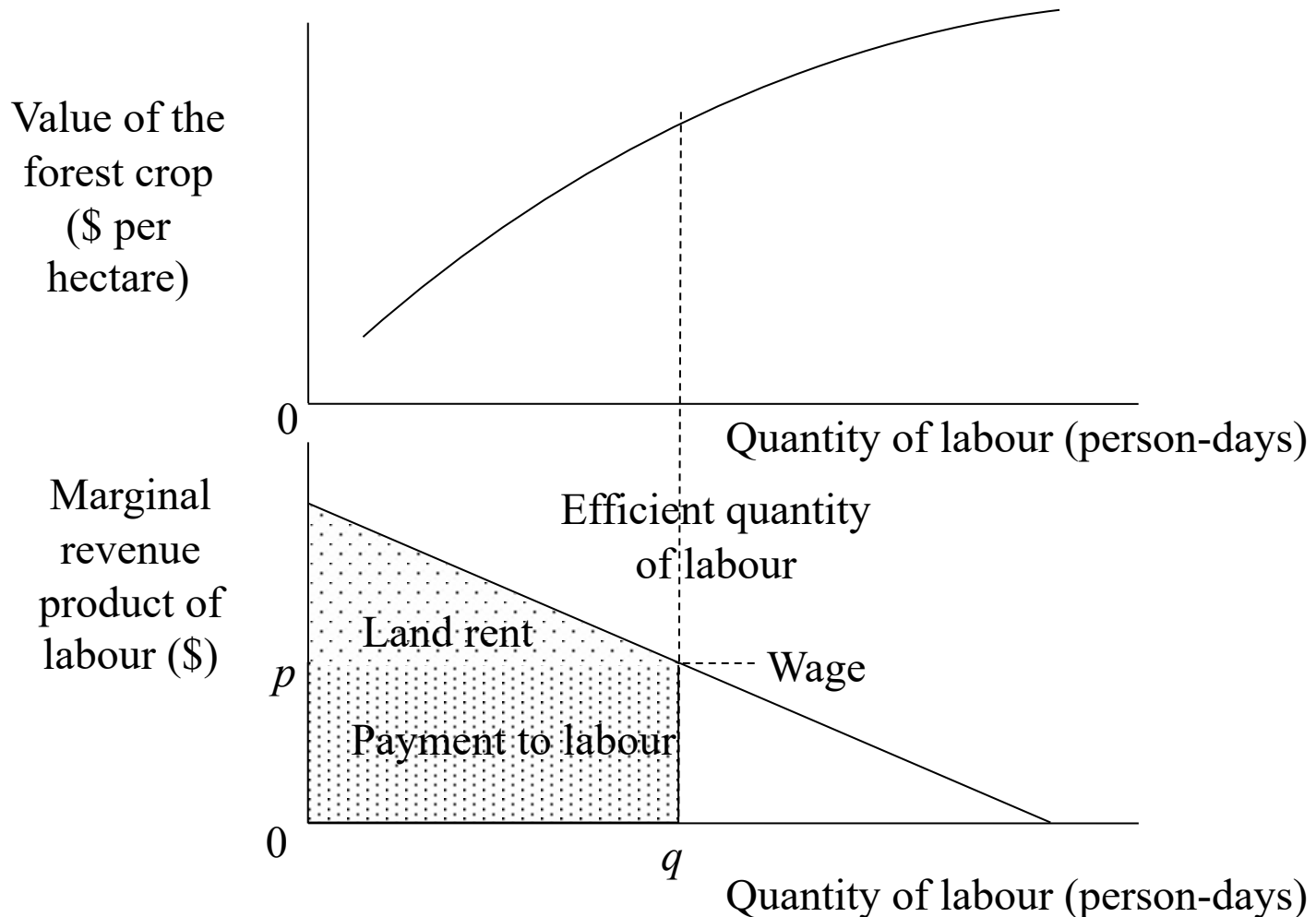


Figure 6.2: Relationship between price of timber and productive timberland

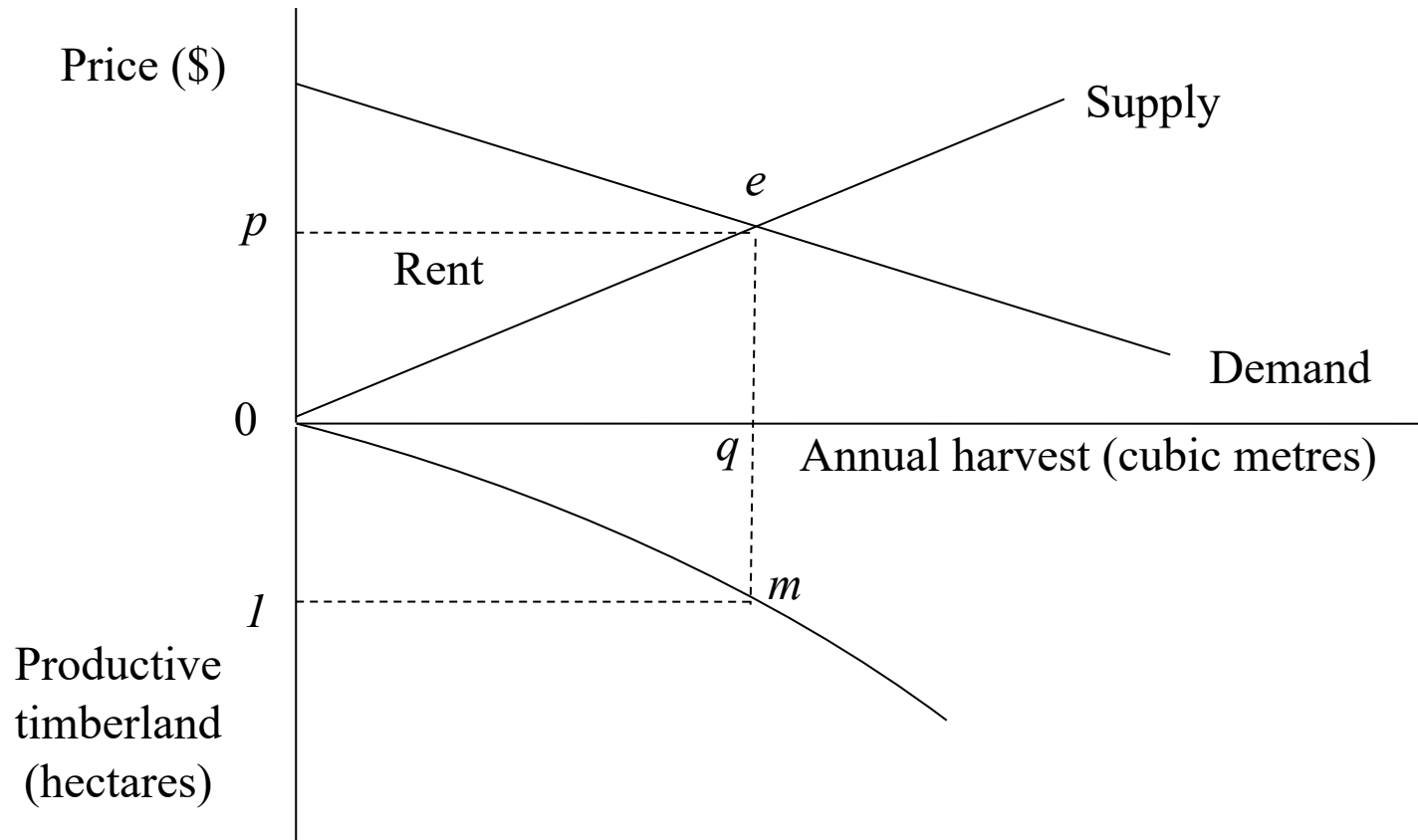


Figure 6.3: Efficient allocation of land among different uses

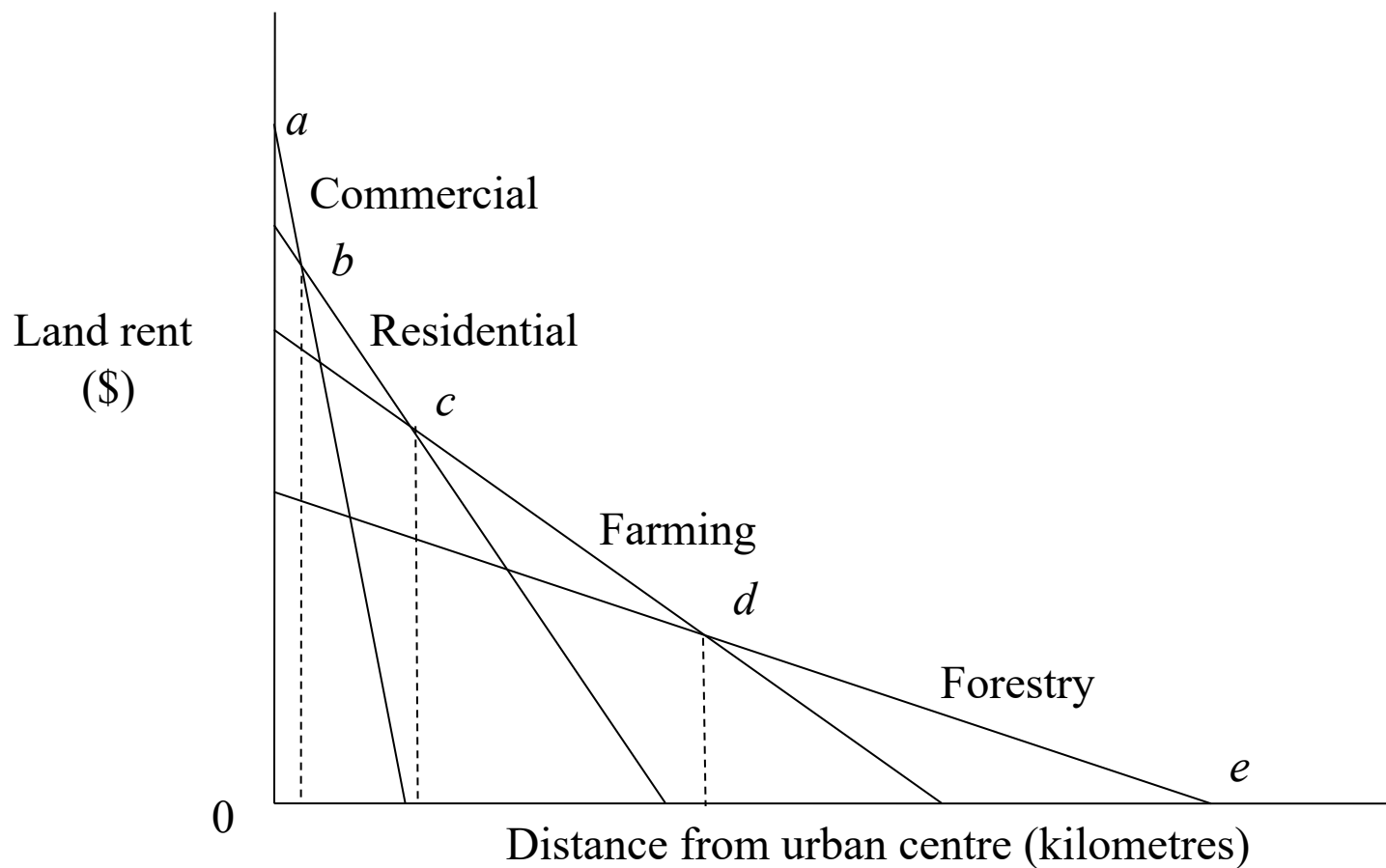


Figure 6.4: Types of production possibilities for two products on a tract of land

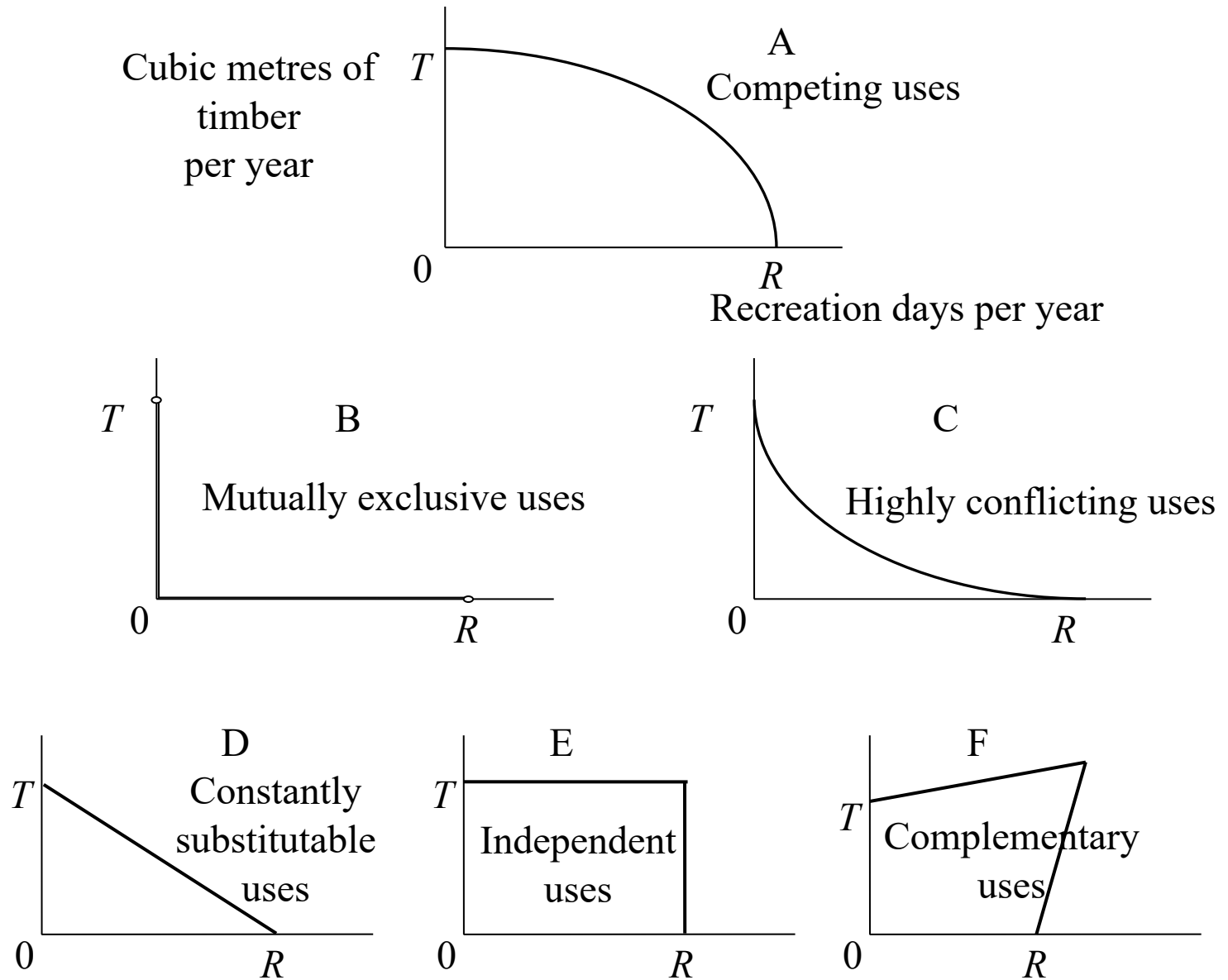


Figure 7.1: Growth in volume and stumpage value of a forest as it increases in age

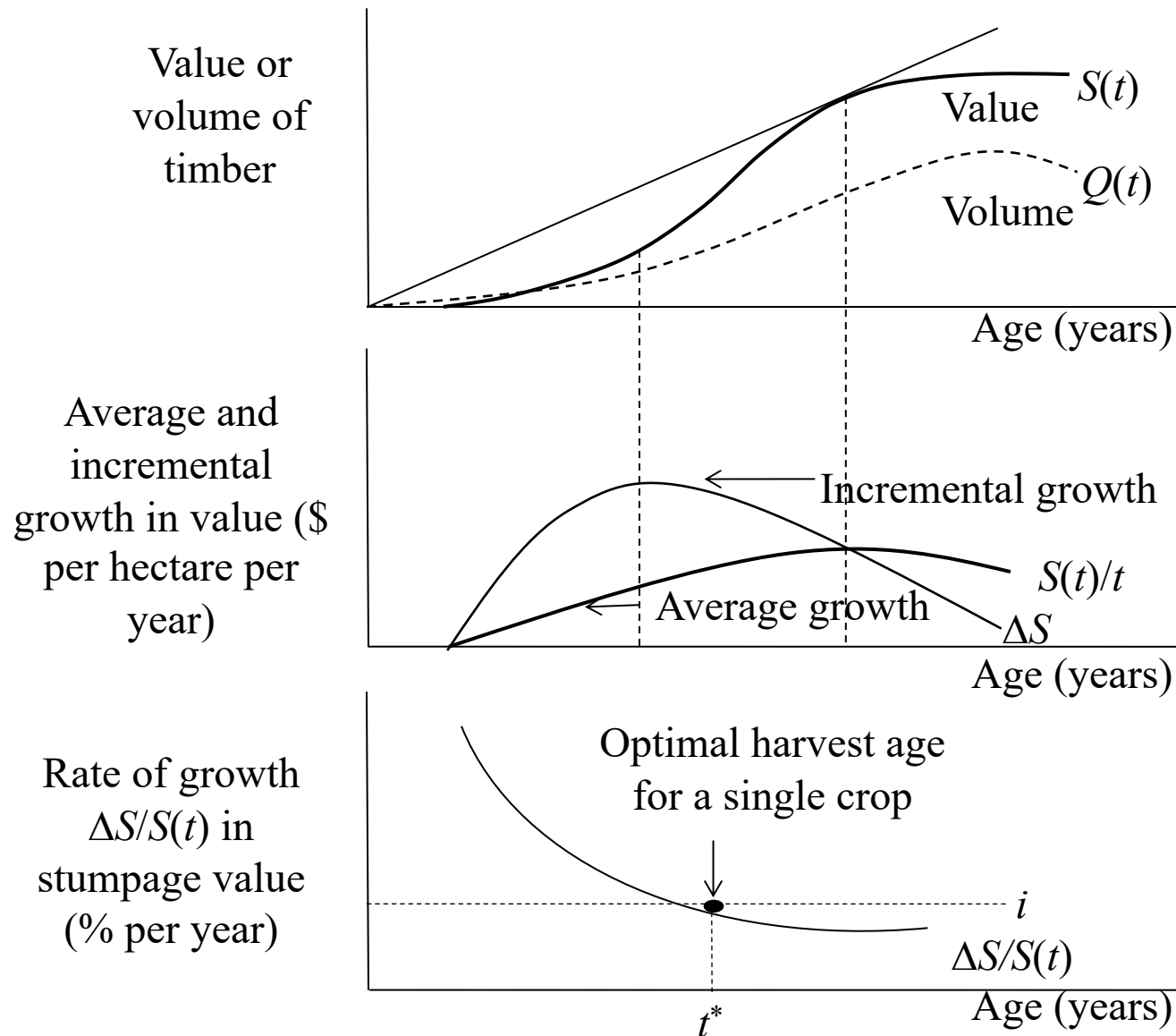


Figure 7.2: Optimal economic rotation for continuous forest crops

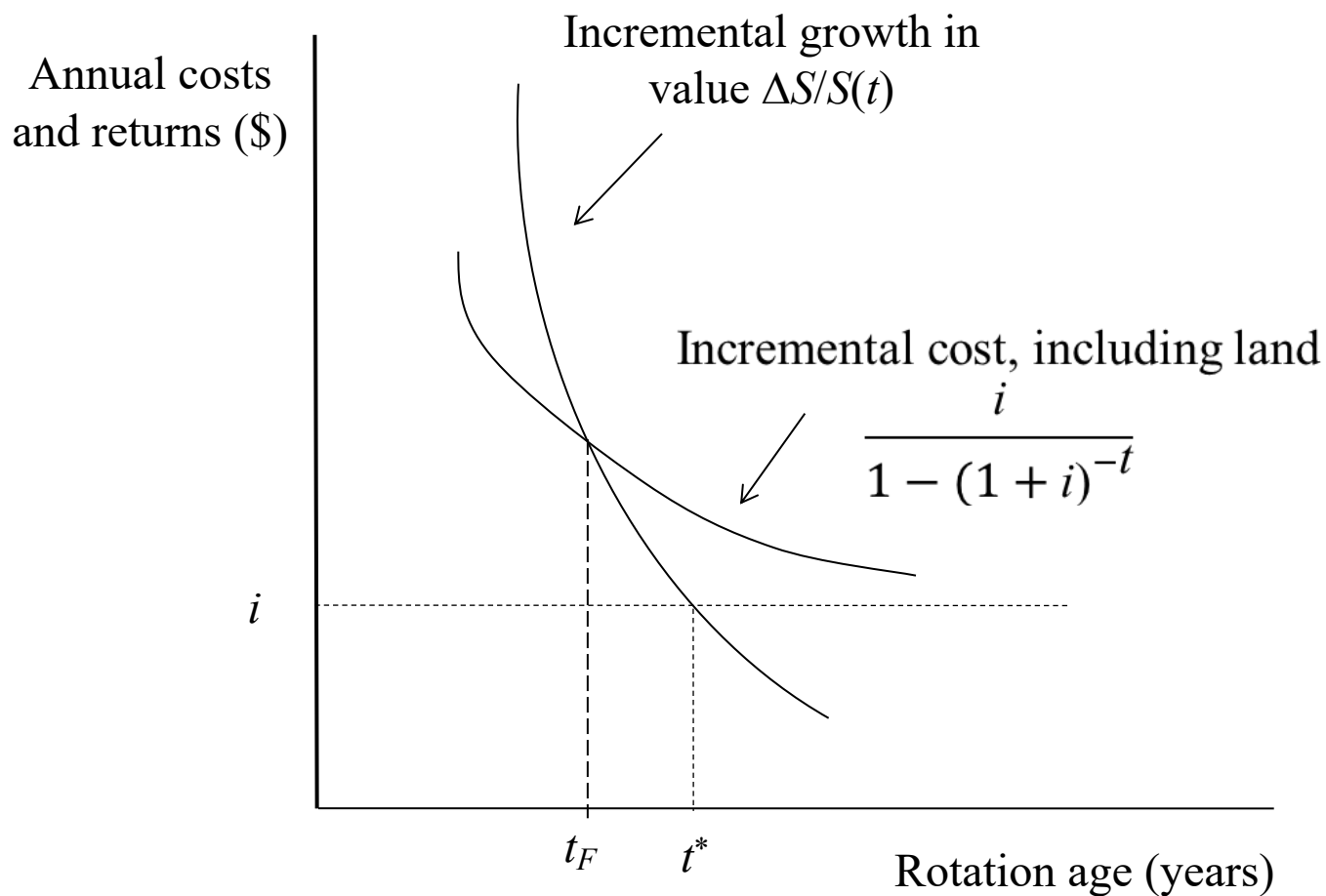


Figure 7.3: Incremental growth in value and costs with stand age

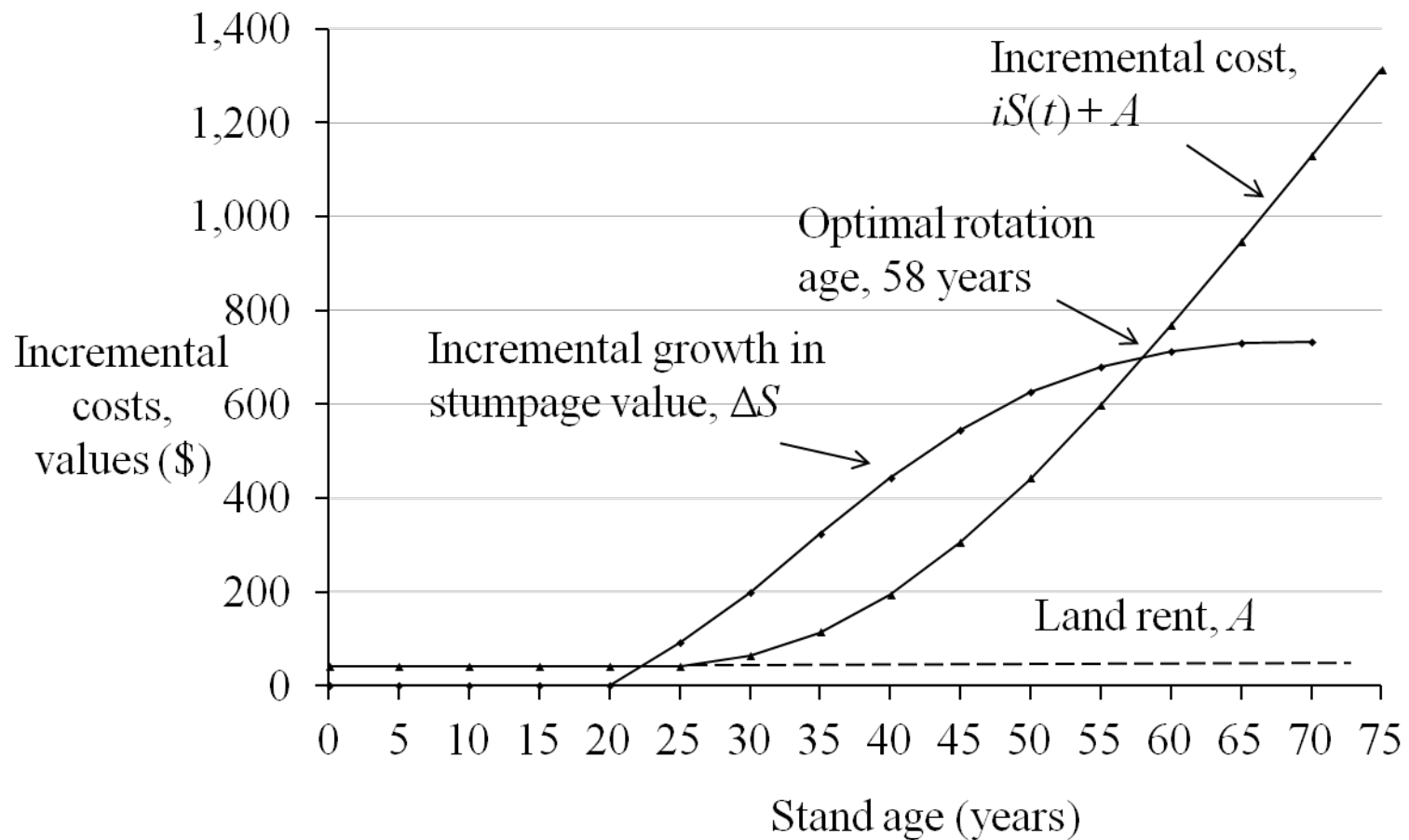


Figure 7.4: Relationship between stand age and various amenity values

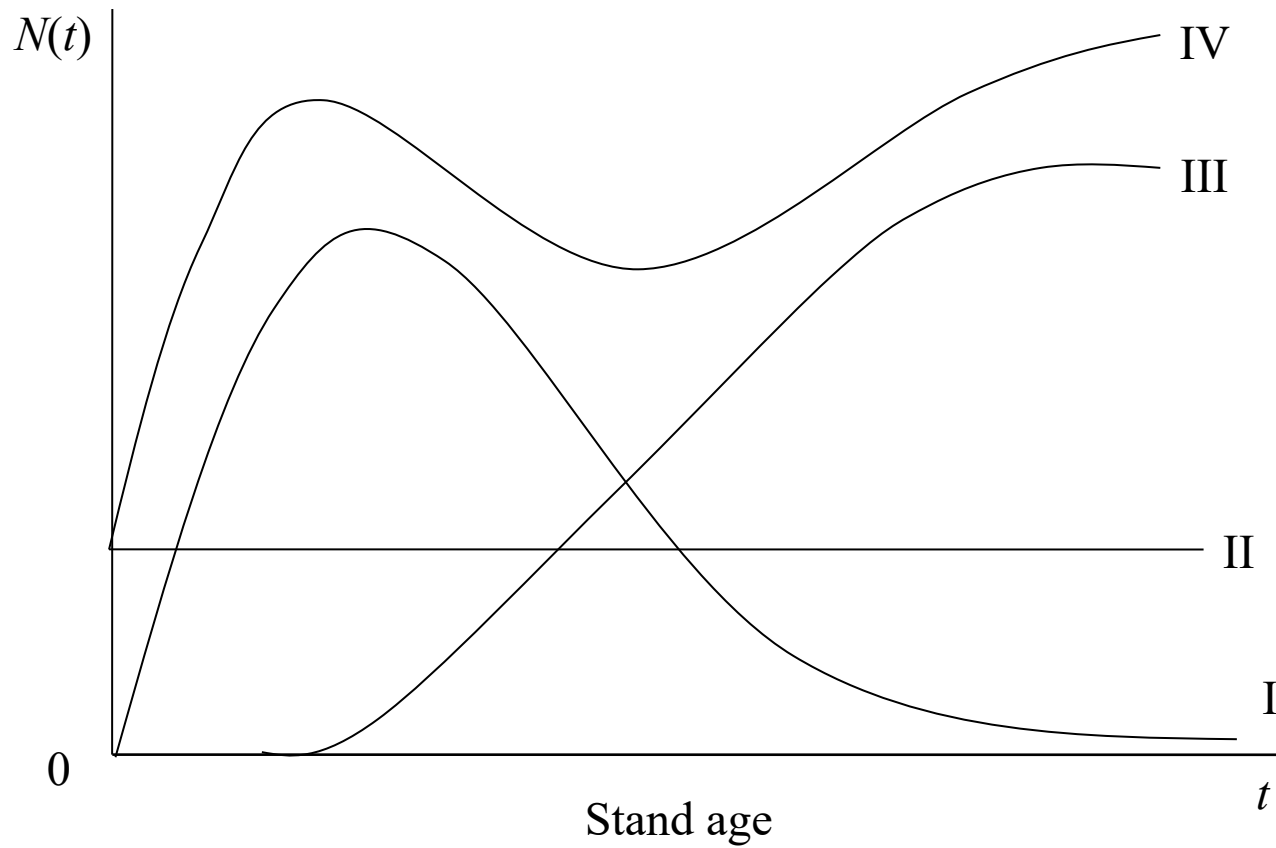


Figure 8.1: Per-acre annual growth, removal, and inventory on private timberland in the US, 1953-2007

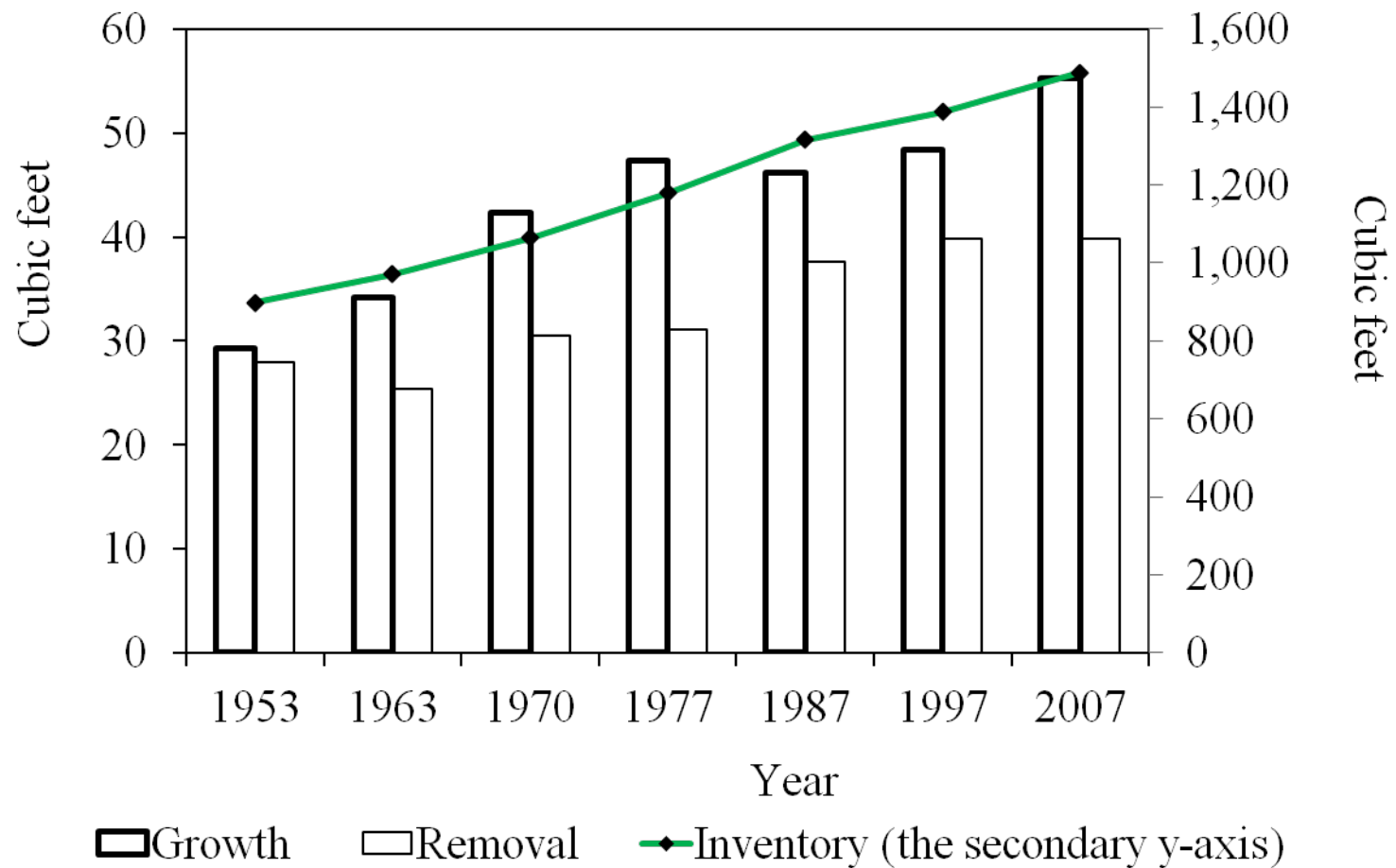


Figure 8.2: Age-class distribution of inventory in private timberland in western Oregon, 1997

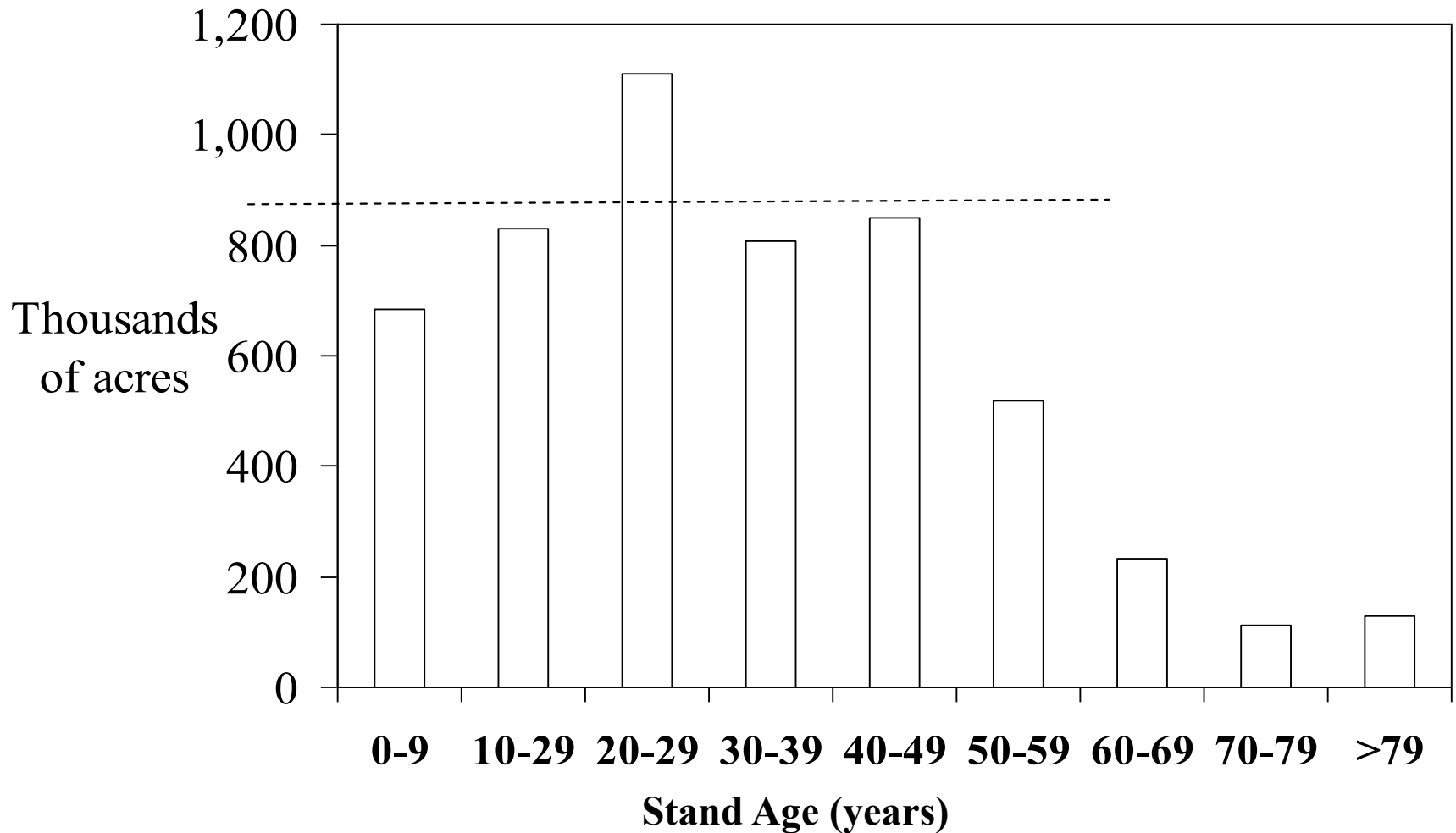


Figure 9.1: Forest area in the United States by region, 1630-2002

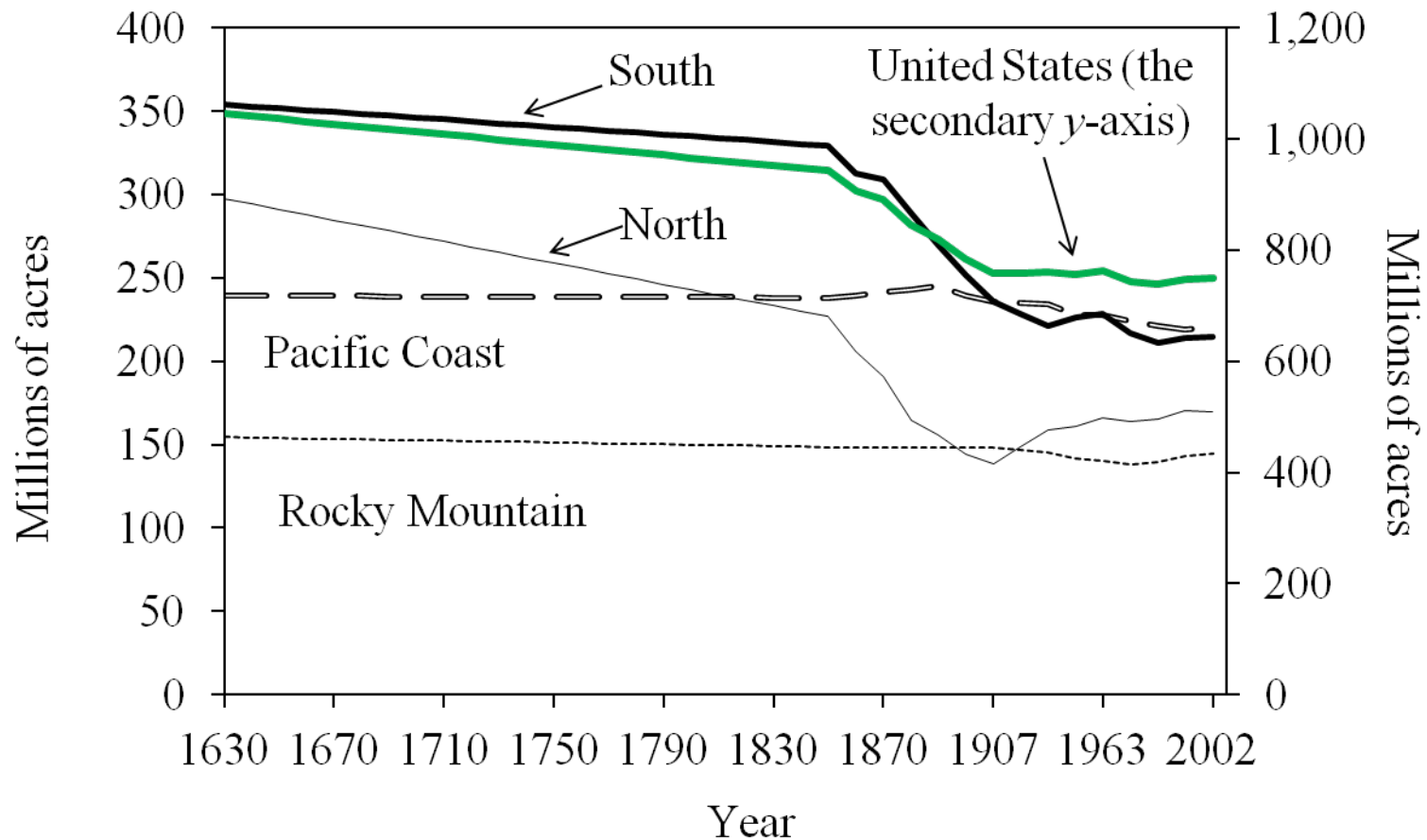


Figure 9.2: Real price indices for lumber and stumpage, in terms of 1992 prices (1992 = 100)

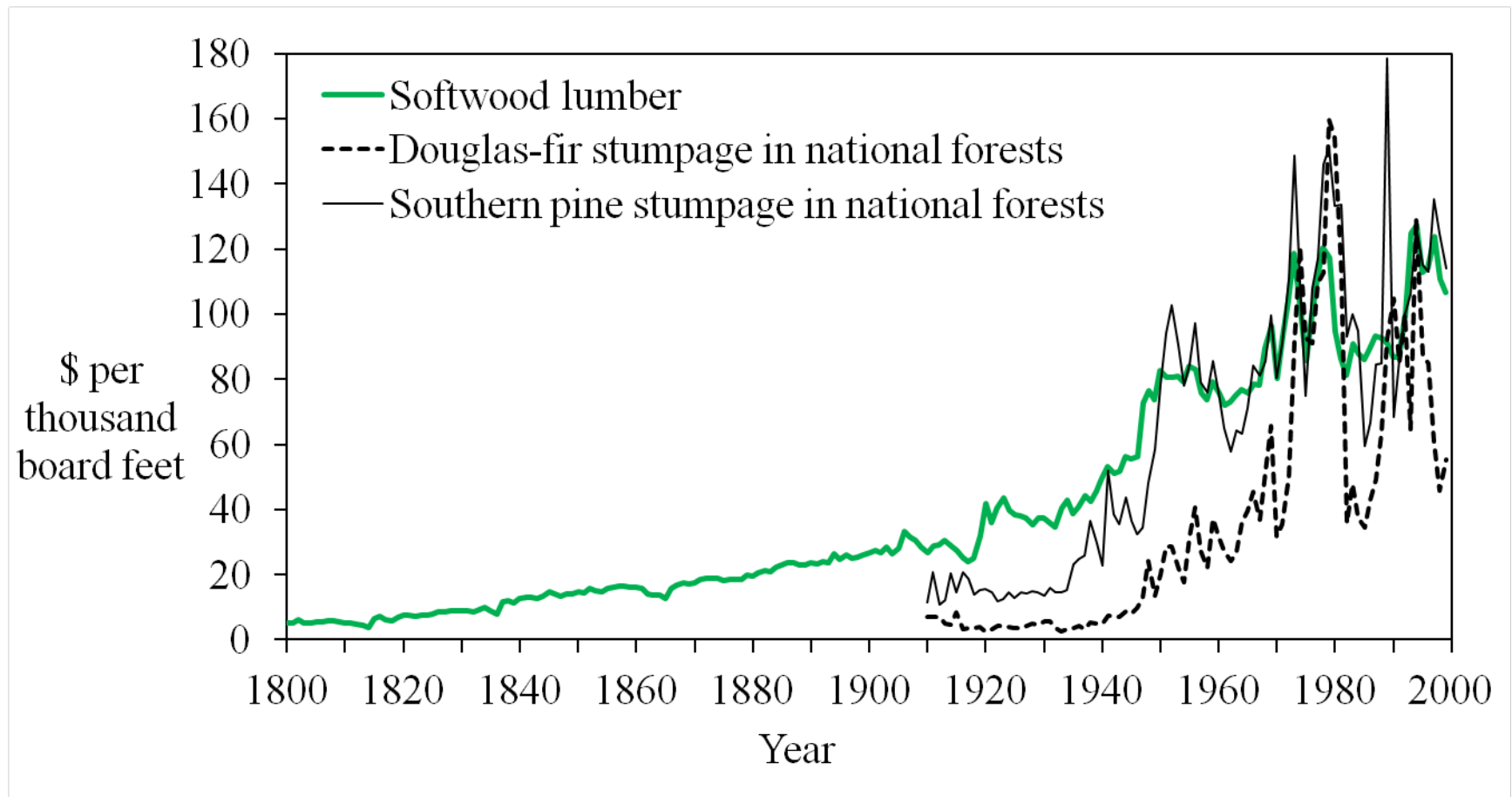


Figure 9.3: The Erie Canal

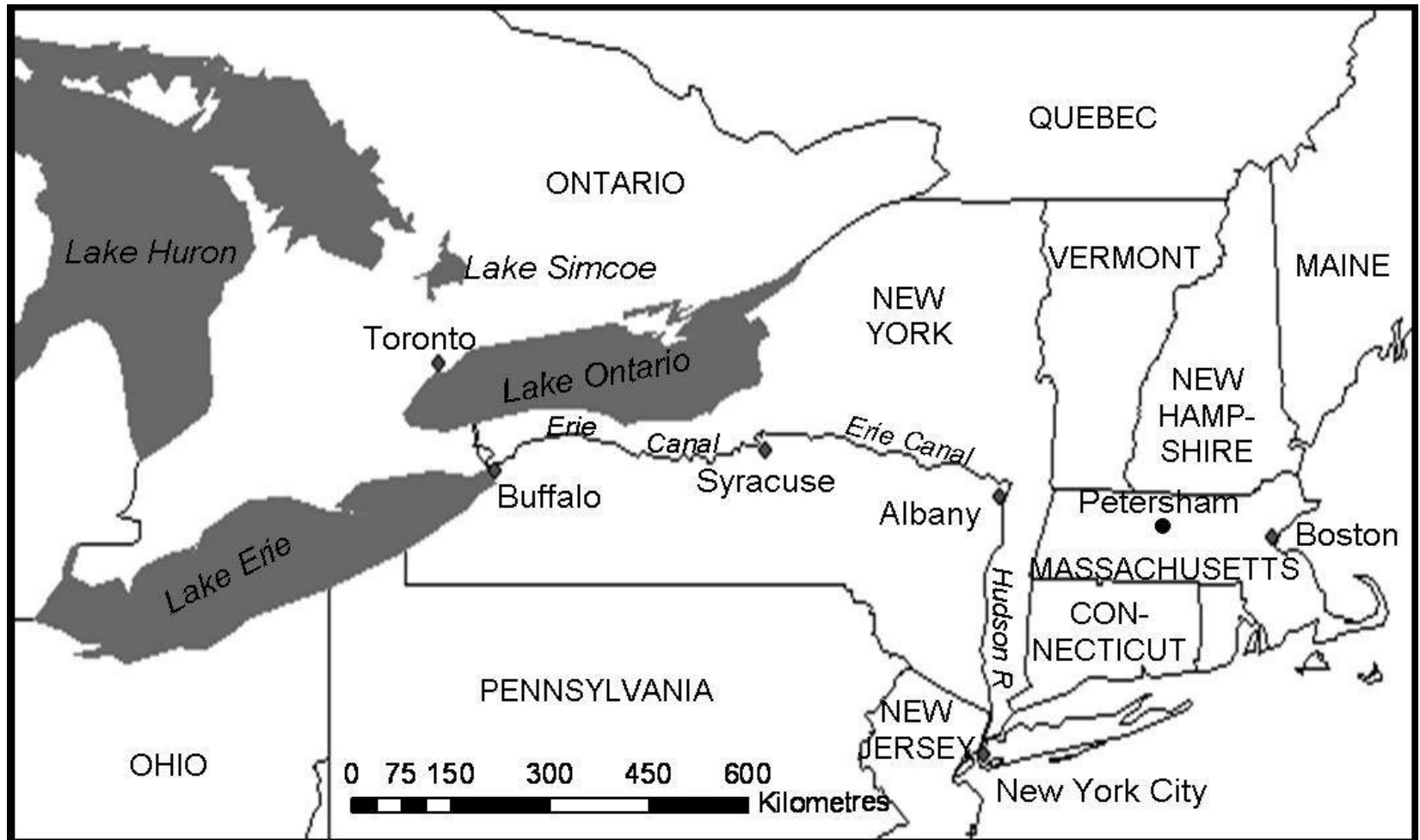


Figure 9.4: Optimal reforestation effort, E^* , changes when stumpage price increases

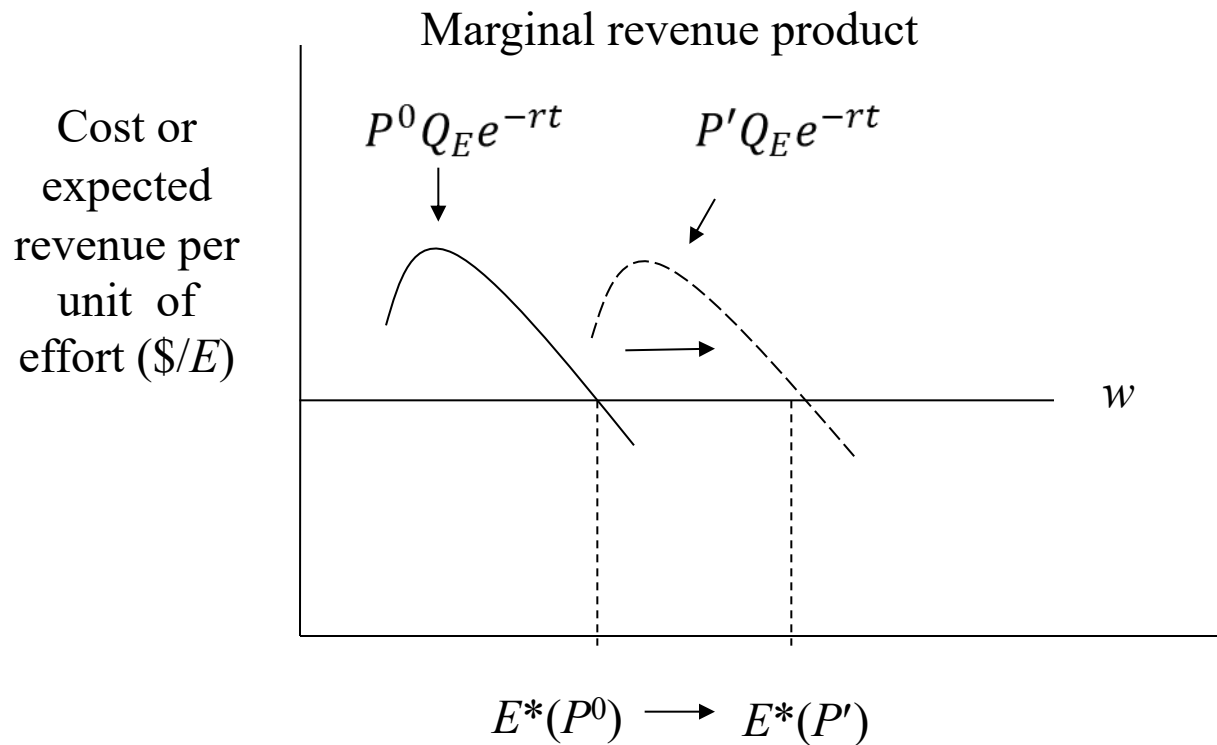


Figure 9.5: Private tree planting in the US South by ownership, 1928-2003

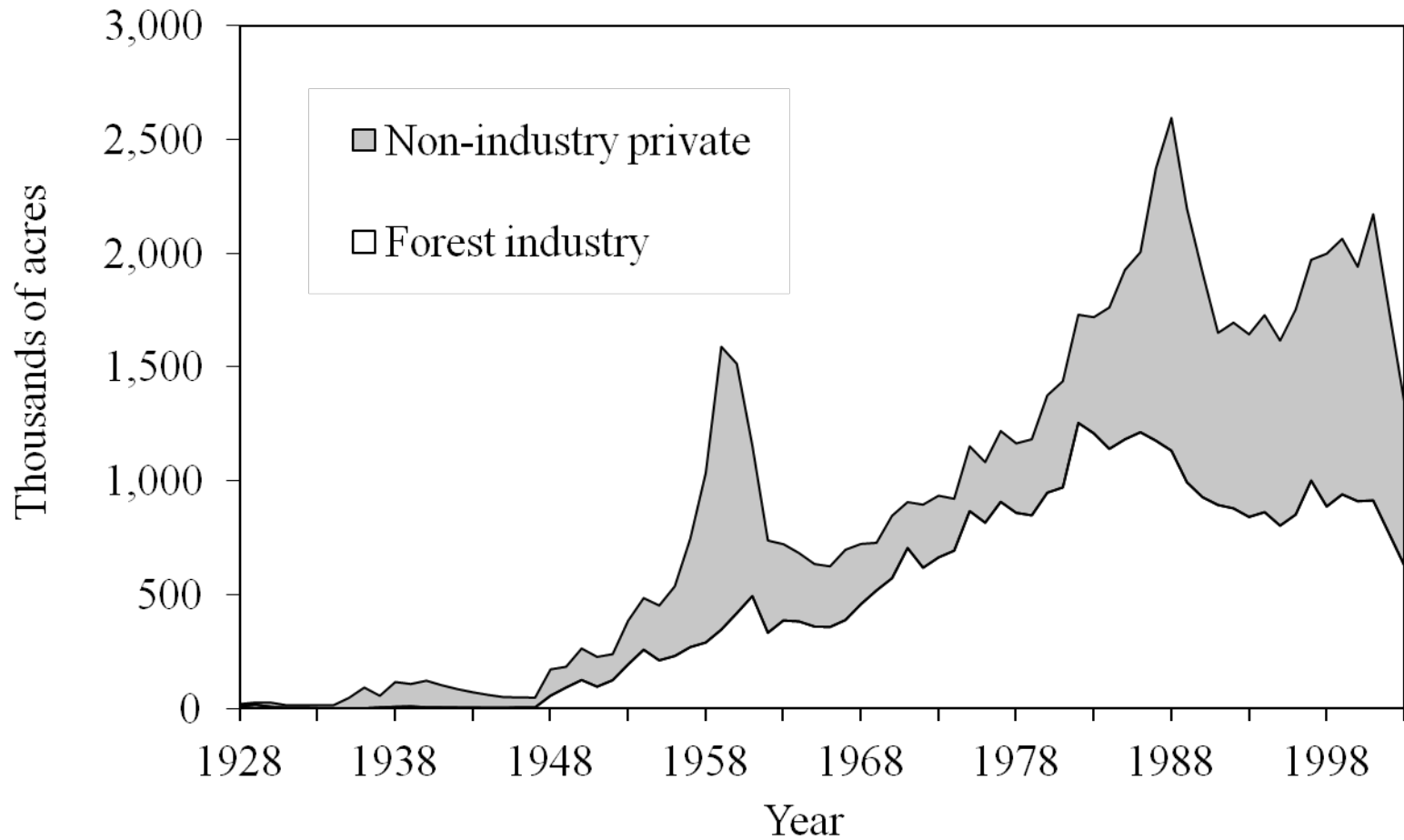


Figure 10.1: The Coase Theorem

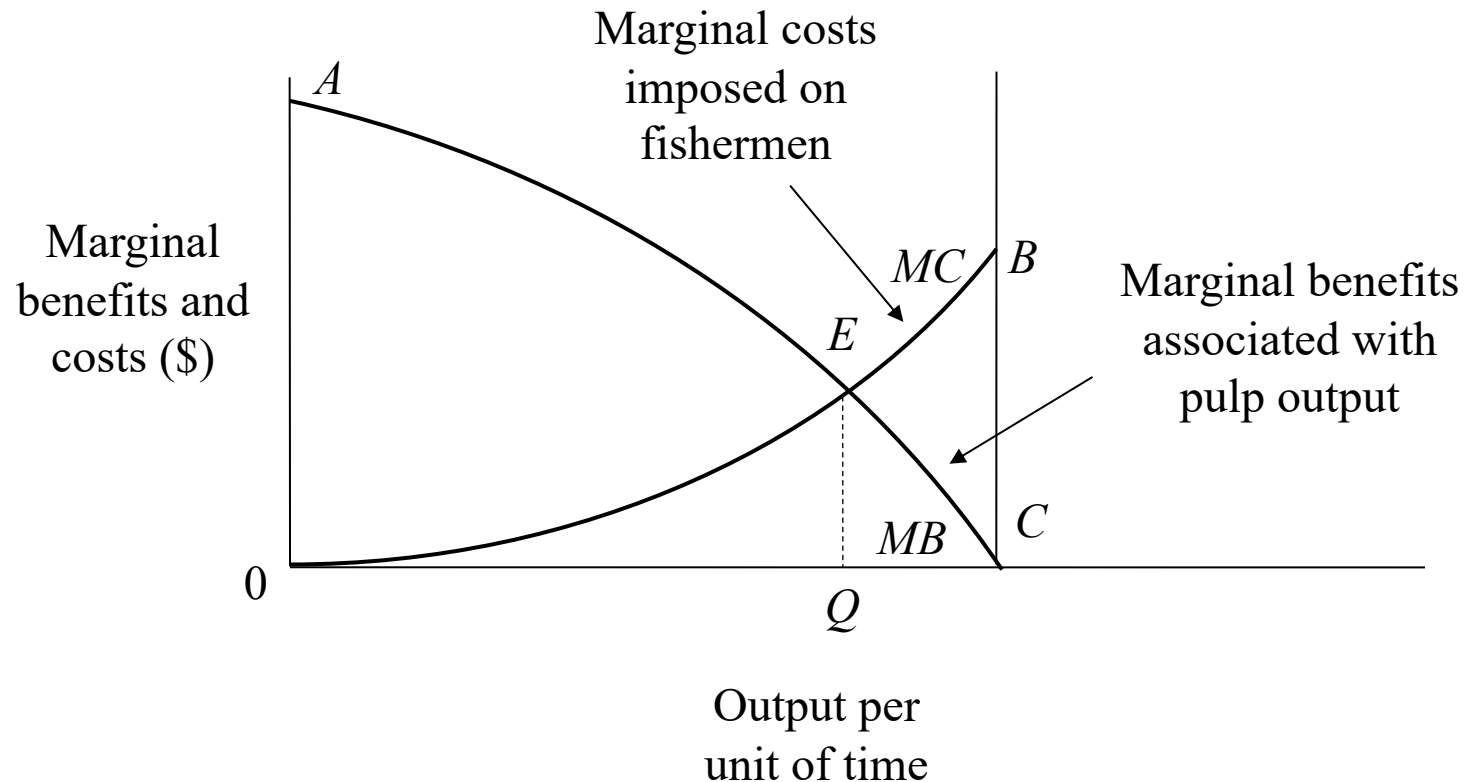


Figure 10.2: Degrees of exclusiveness of forest tenure

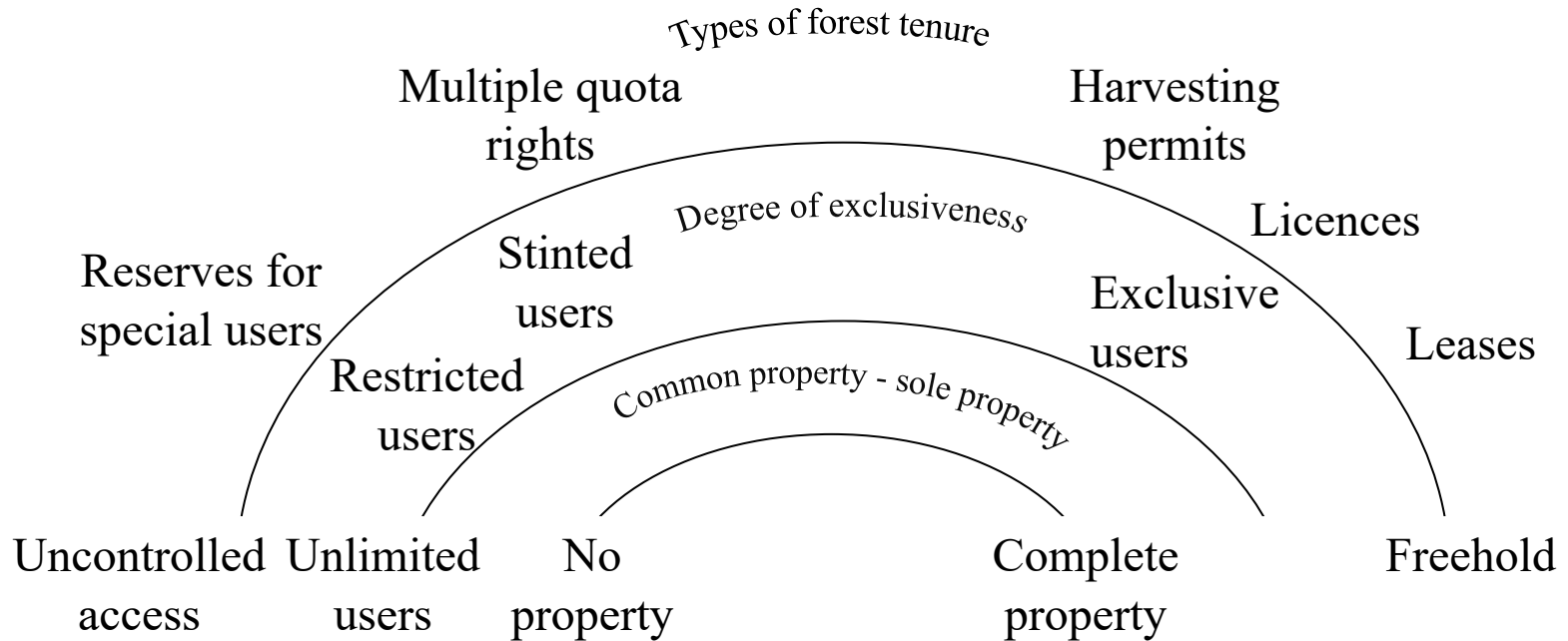


Figure 10.3: Combinations of attributes in forest property

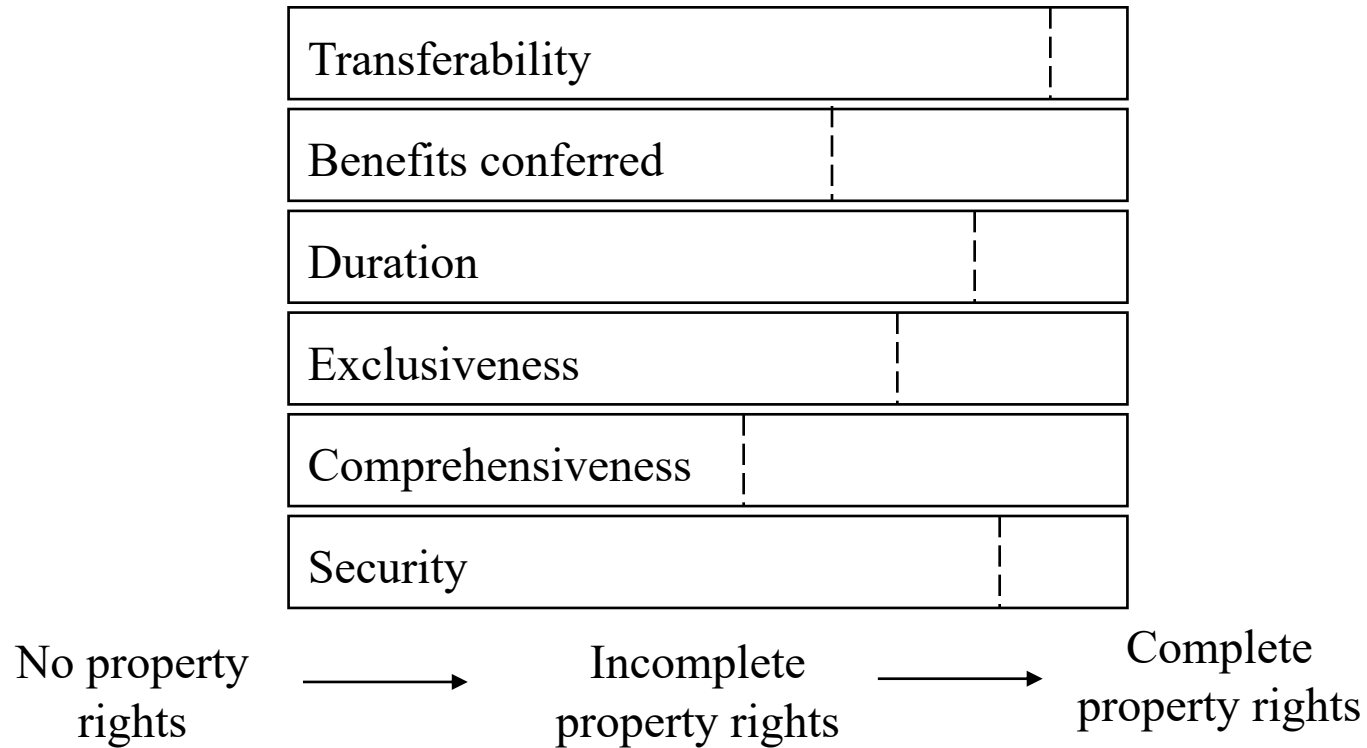
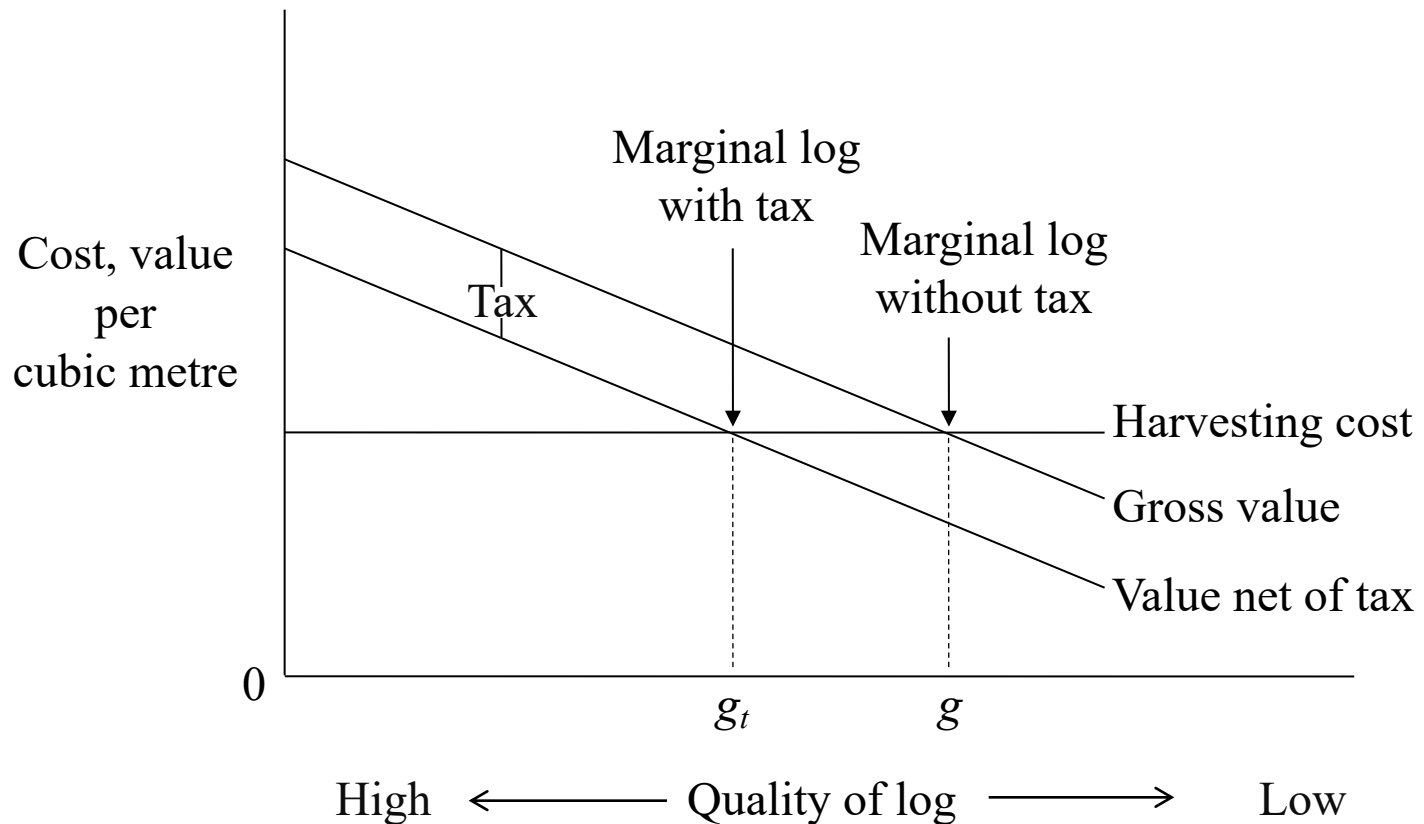


Figure 11.1: Effect of a royalty or severance tax on the range of log quality that can be profitably harvested



Although the next two graphs (Figures 11.1a and 11.2b) do not appear in *Forestry Economics*, the material in these graphs are discussed on page 315 of the book. They are presented here to facilitate teaching and help students understand the relevant discussion on yield taxes.

Figure 11.1a: Effect of a yield tax that applies to the gross value of logs on the range of log quality that can be profitably harvested

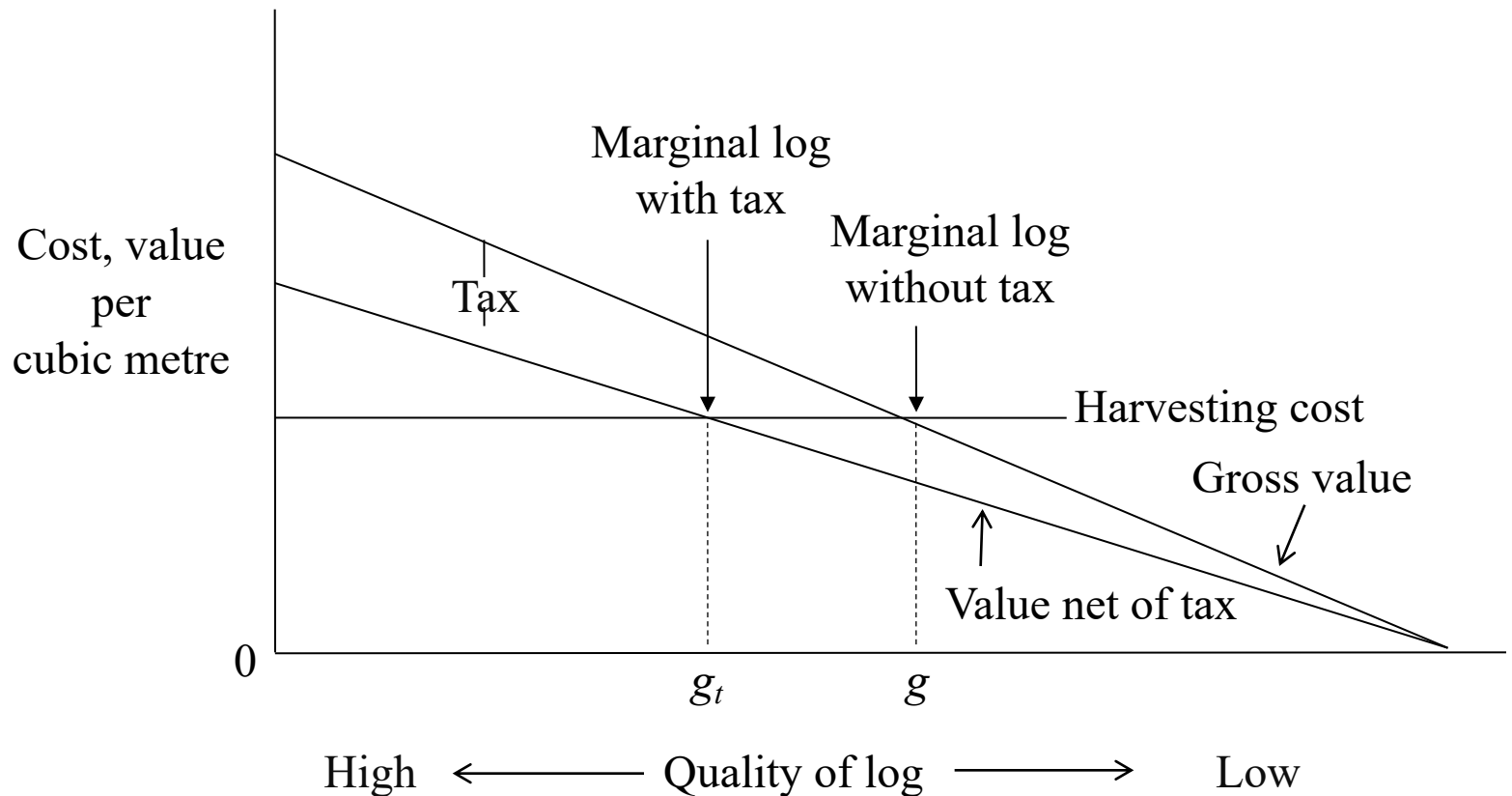


Figure 11.1b: Effect of a yield tax that applies to the net value of logs on the range of log quality that can be profitably harvested

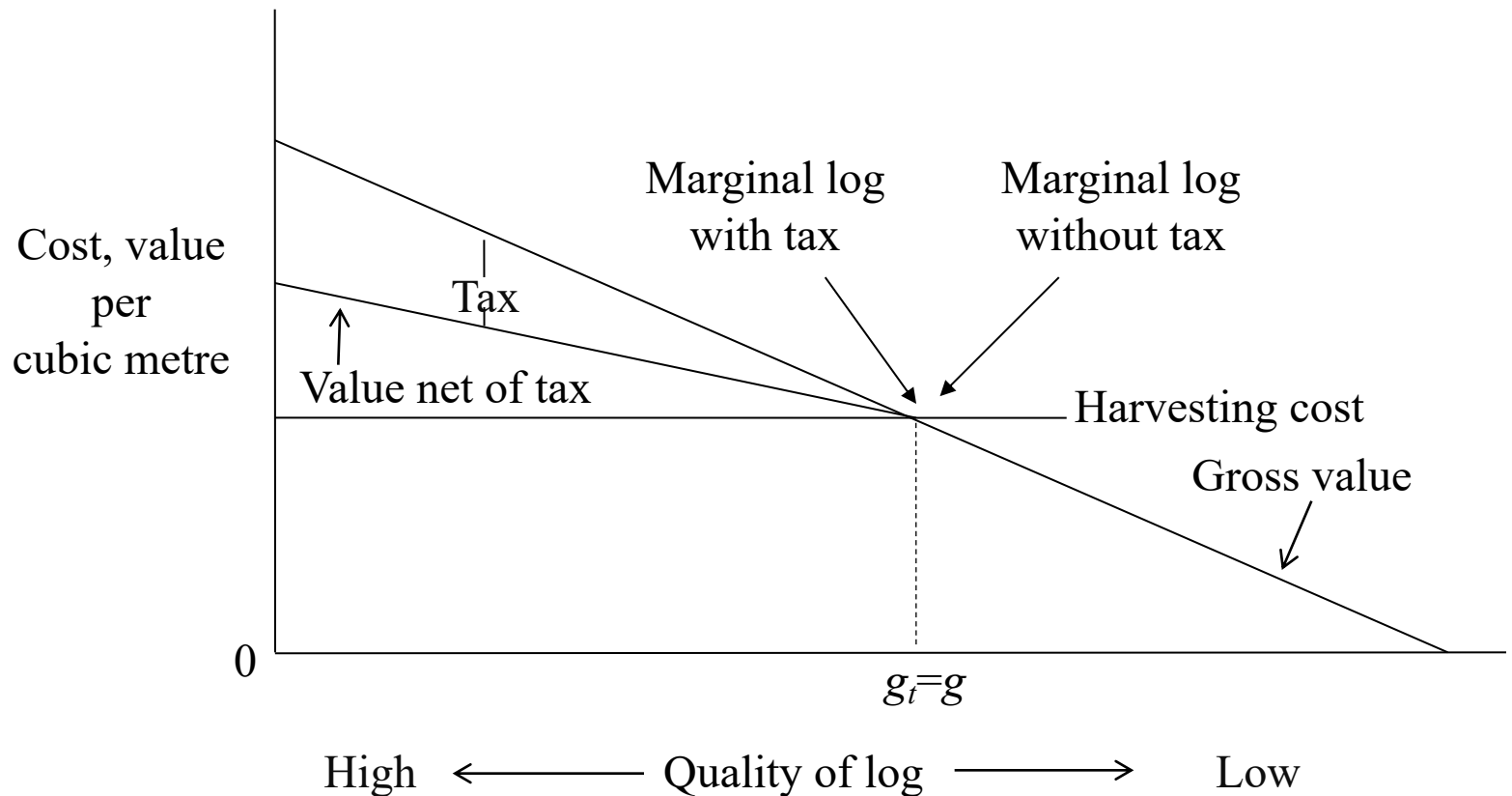


Figure 11.2: The relative burden of tax

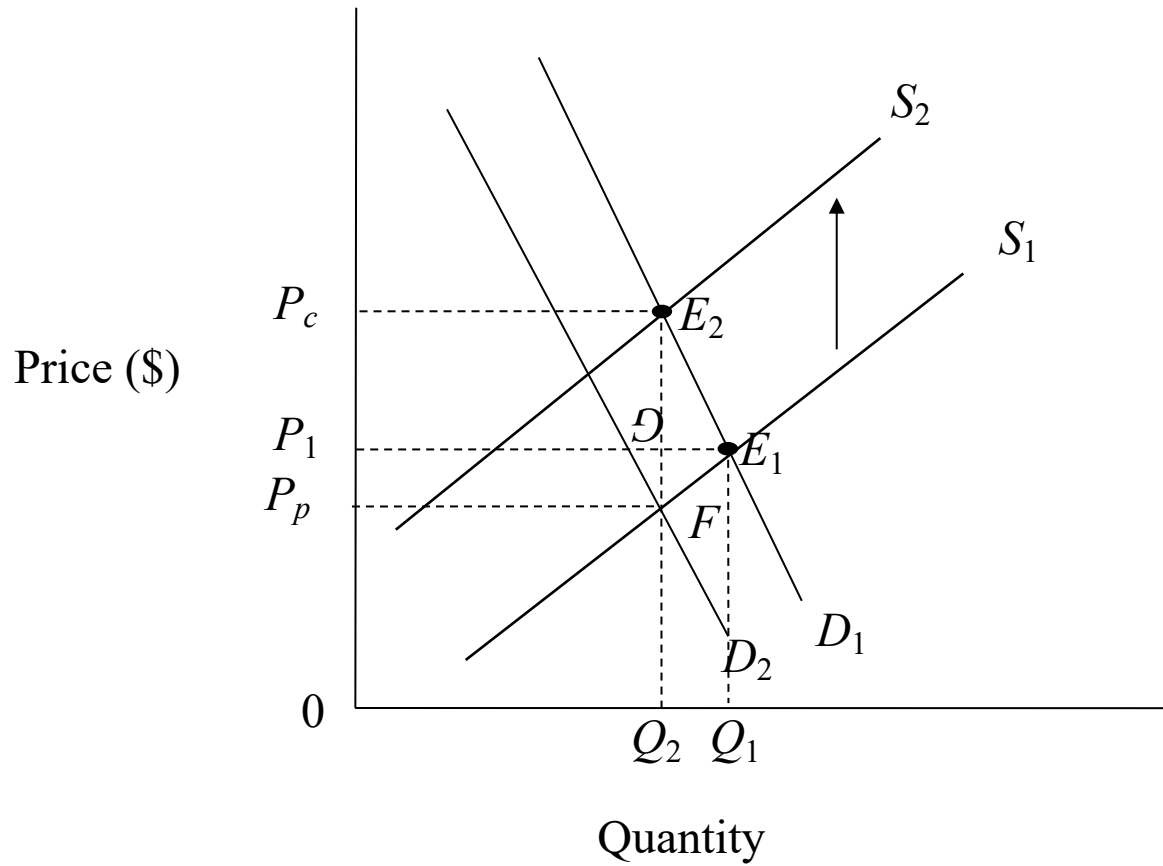


Figure 12.1: Global export volume of different forest products, 1970-2006

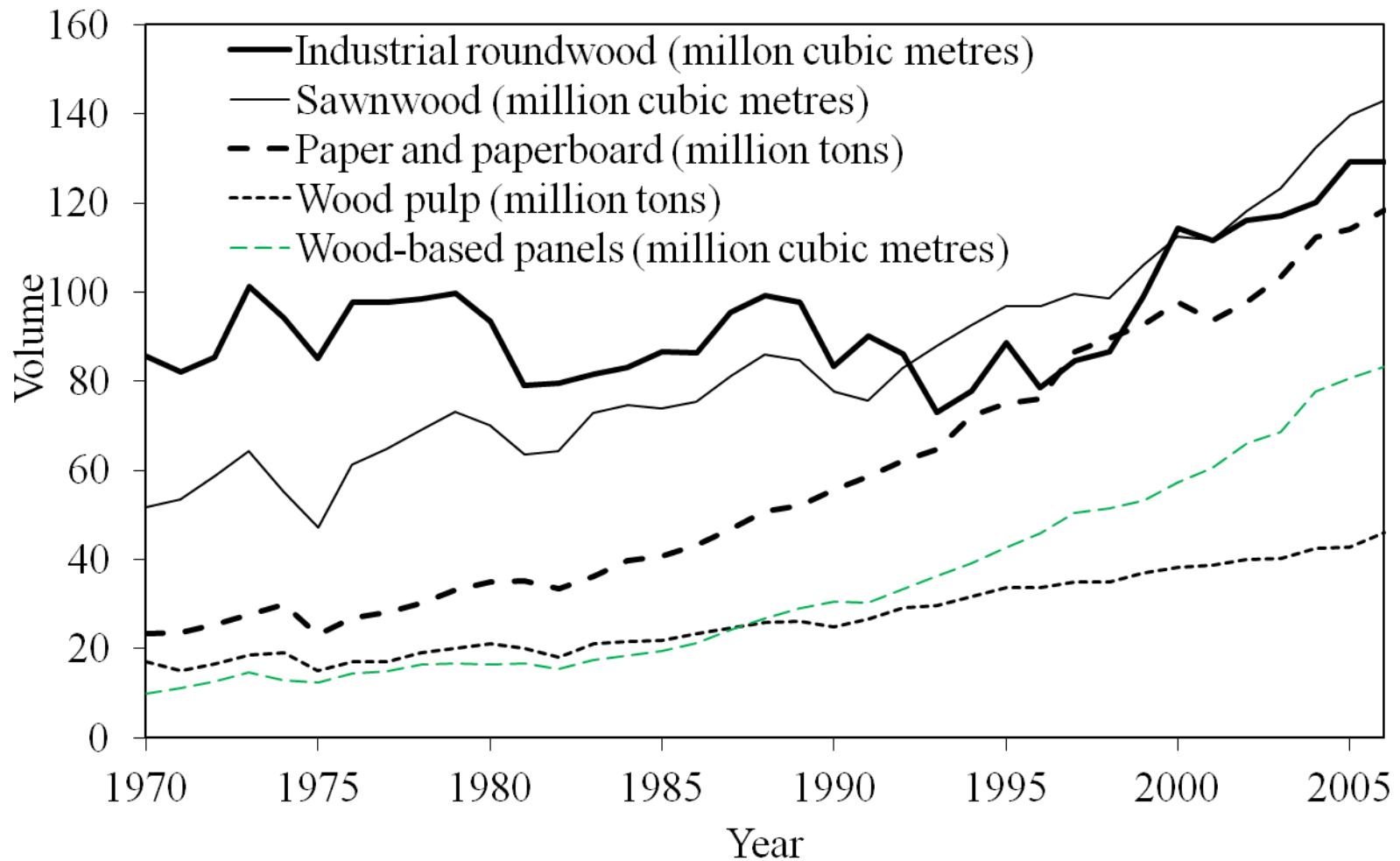


Figure 12.2: Determination of price and quantity of plywood to be imported and exported when trade is free, transportation costs are negligible, and all else remains constant

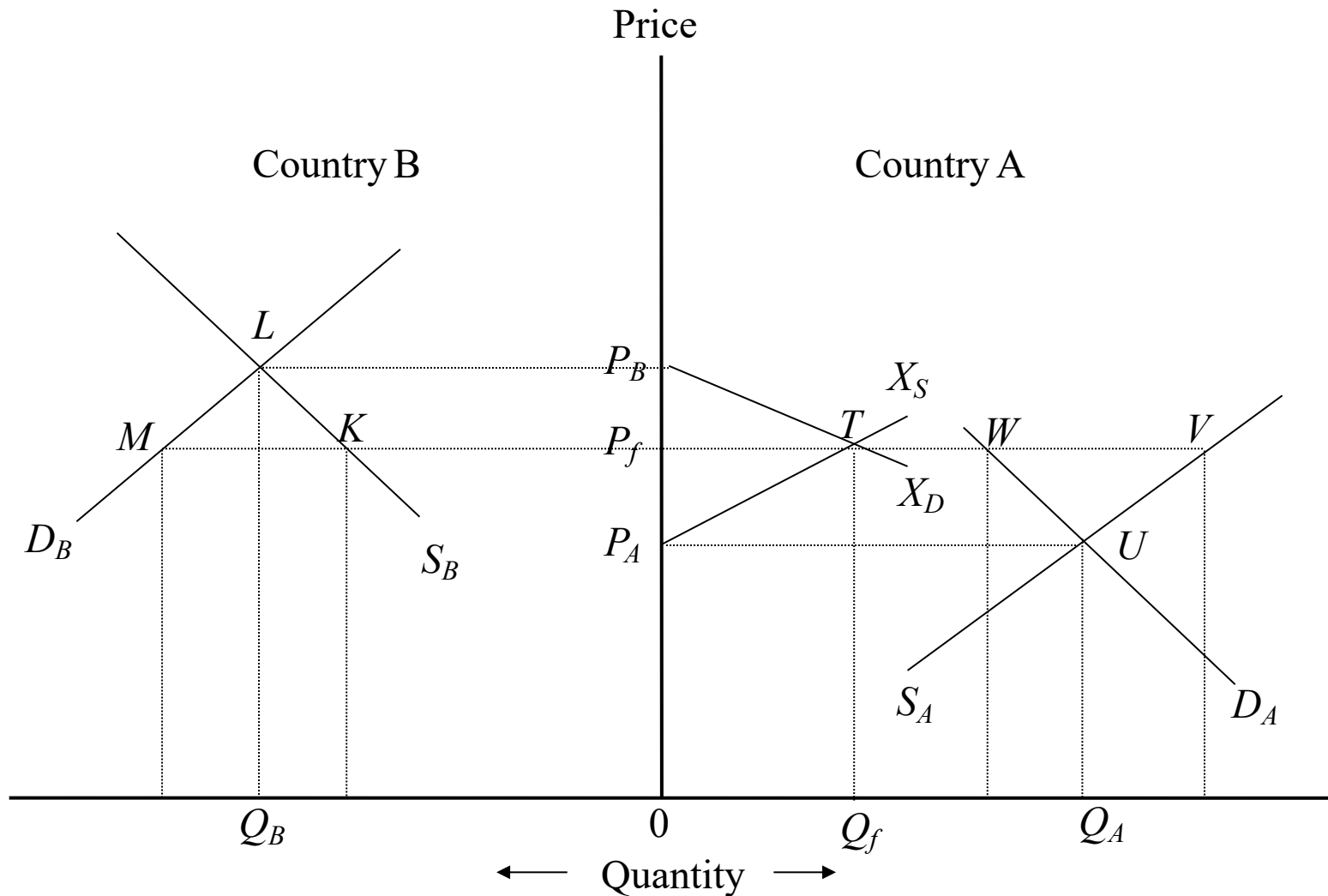


Figure 12.3: US outward and inward foreign direct investment in forest industry in constant 2000 US\$, 1983-2008

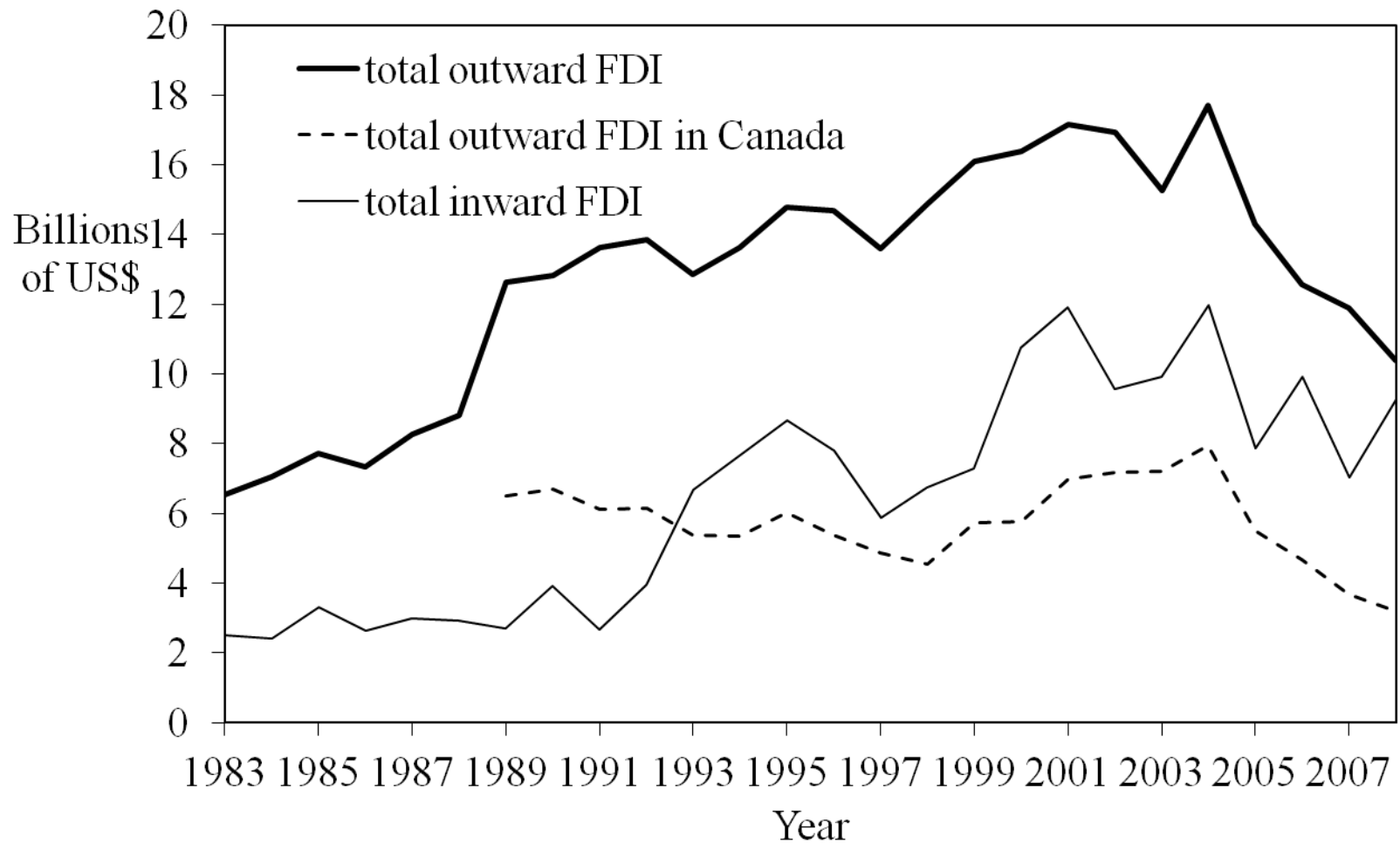


Figure 12.4: Canadian outward and inward foreign direct investment in forest industry in 2000 constant CND\$, 1983-2008

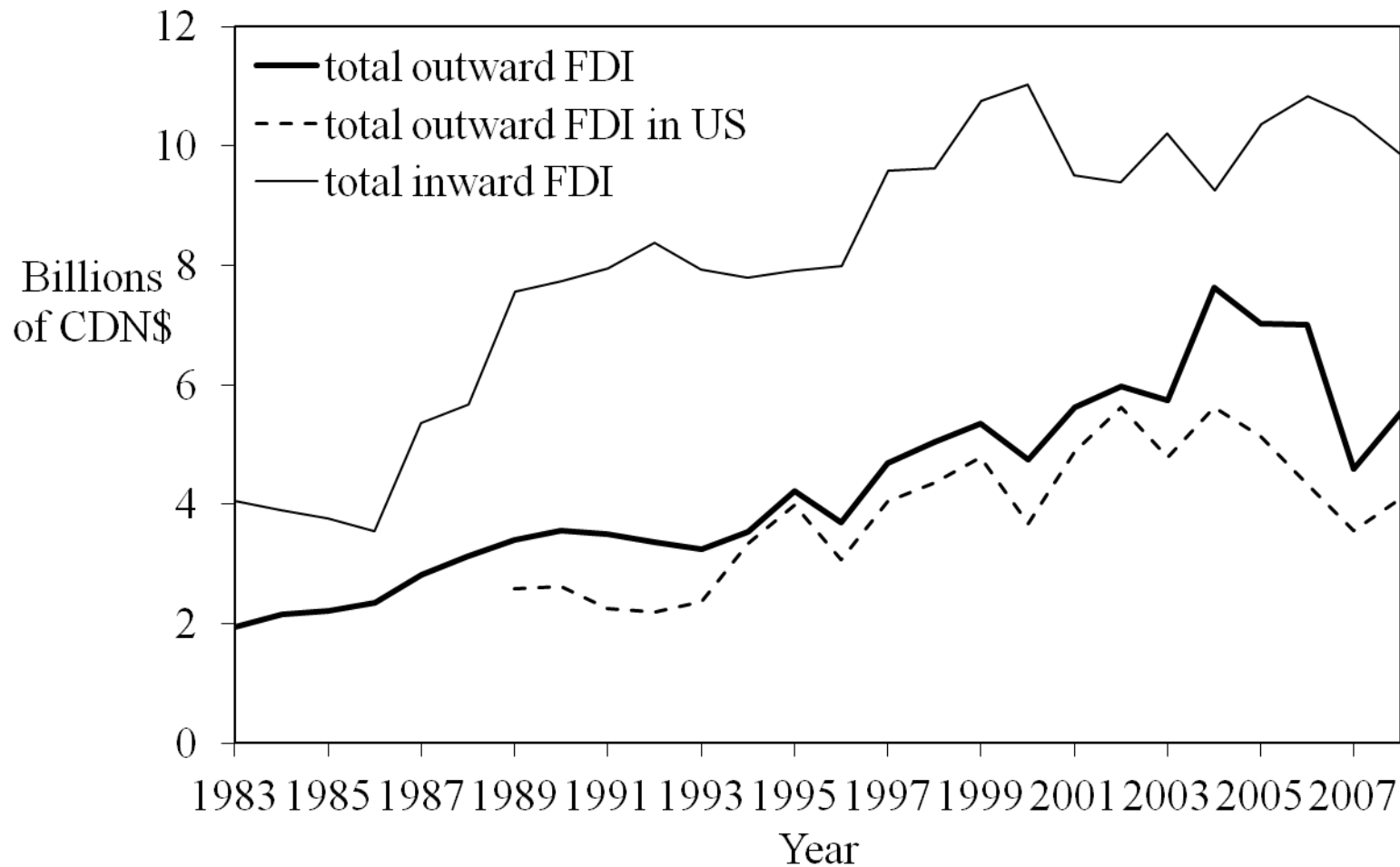


Figure 13.1: The Environmental Kuznets Curve

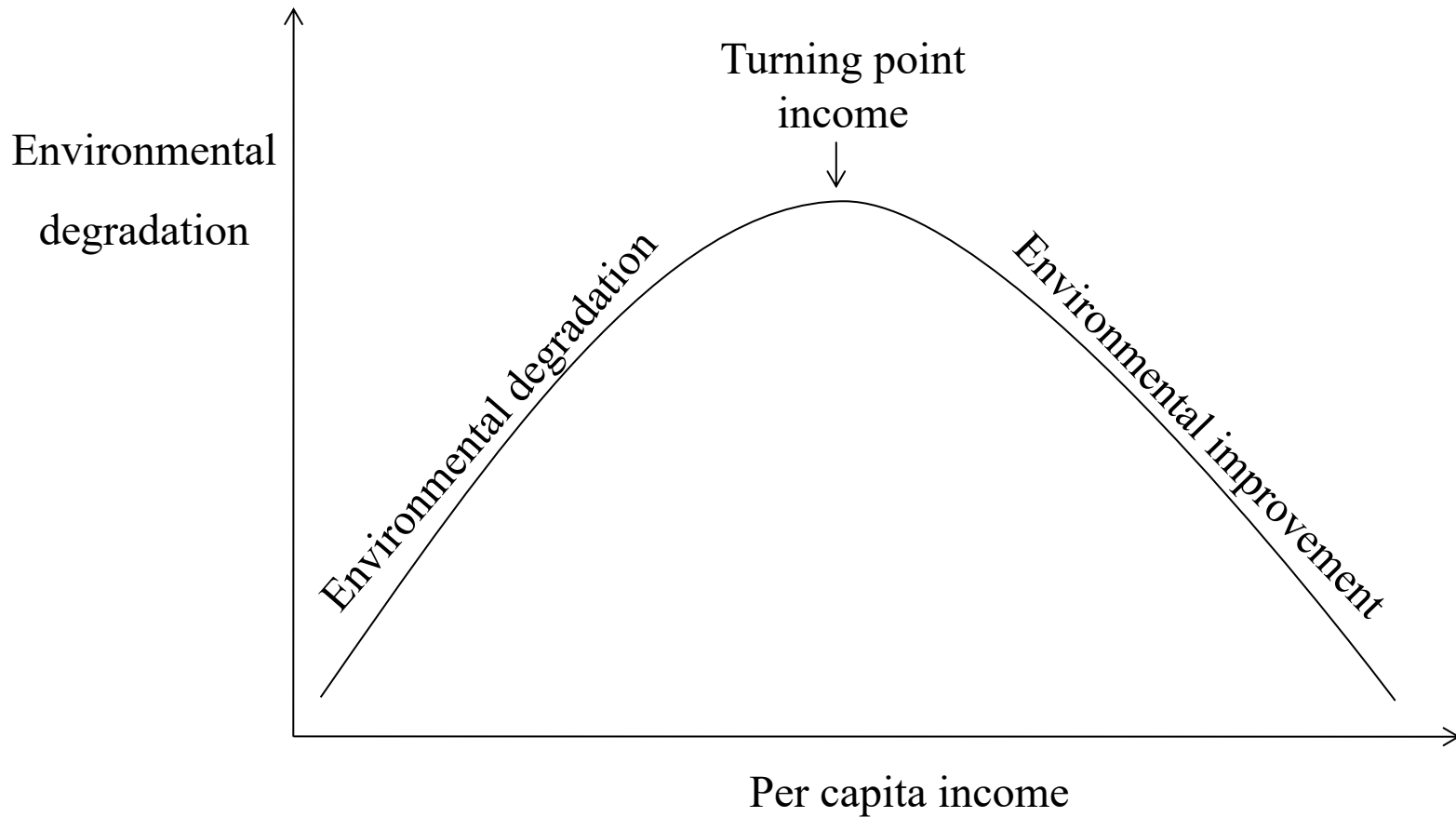


Figure 13.2: Direct and underlying causes of tropical deforestation

