

ABSTRACT

**Relationships among the Optimal Production Rates,  
Unit Costs and Profit Rates Determined for Three Economic Criteria**

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This paper shows a property that a value of production rate which maximizes profit per unit time lies between the highest production rate and the production rate which minimizes production cost per unit product. A similar property holds among the unit production costs under these production rates. Moreover, some sufficient conditions for which the optimal value of decision variable which realizes the maximum profit rate lies between the optimal values realizing the other two criteria are derived. The last result is an extension of the theorem concerning the economic cutting speed for a machine tool, which says that the maximum-profit cutting speed lies between the minimum-production-cost cutting speed and the maximum-production-rate cutting speed.