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ABSTRACTS

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THE IMPACT OF INFLATION ON THE OPTIMAL SERVICE LIFE OF A MACHINE

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The decision problem concerning the optimal service life of a machine has been the subject of extensive recent investigation, both because of the practical importance of the question and because of the interesting mathematical problems posed. Most of these replacement models utilize the assumption about stable prices. In the light of considerable inflation especially in the 1970's this assumption doesnot, however, seem very realistic any more.

The present study attempts to analyze how and with which power does inflation affect the optimal service life of a machine. The method to be used is based on the net present value of the cash-flows. The present values are calculated using discrete flows and continuous inflation and discounting. This technique has several mathematically nice and useful advantages with it.

The net present value model is formed and considered as a function of the rate of inflation. The parameters of the model are the length of the planning horizon, the type of the investment process (chain of replacements or a single machine) and the salvage value of the machine. As a solution the dependence of the optimal service life on the rate of inflation is obtained. Both analytical and simulated numerical results are derived. The effects of the parameters are also discussed. As an application the fleet of buses is considered.