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Analysis and Existence of Optimal Control in Industrial Economic Growth with Investment Using the Ramsey-Cass-Koopmans Model

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Abstract: Economic growth is associated with an increase in the production of goods and services. Consumption and investment influence the increased production of goods and services. Consumption parameters can be assessed based on utility, while investments can be affected by the level of capital stock. This paper applies a modification and analysis of the Ramsey-Cass-Koopmans model to the economic growth of two industries, focusing on investment strategies to maximize consumption utility. The analysis of the Ramsey-Cass-Koopmans model showed that the model is valid as it has a positive and unique solution. This study performs optimal control by maximizing the consumption utility of each industry, where the control is given in the form of per capita consumption. In this paper, consumption control can be interpreted as a form of savings. In addition, the existence of optimal control is proven, indicating that the problem can be solved.

Keywords: *Ramsey-Cass-Koopmans model; utility; optimal control; investment.*

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