Endogenous technological progress for natural resources economics and climate change analysis *

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Abstract

This paper evaluates the role of natural resources and technical progress in an endogenous growth model in the context of global climate change. We study an optimal growth model with two types of natural resources: renewable and non-renewable, two types of endogenous technical progresses in the energy sectors: for the improvement of renewable resources to produce bio-fuel and for the final output. The model also consists of the climate constraint that allow us to analyze the impact of pollution on the social welfare and on the production process when fossil fuel being used. We are able to calculate the analytical growth rates at the steady state and analyze the transitional dynamics. Moreover, by studying the decentralized equilibrium analysis, we show that the appropriate environment policies and the substitution mechanisms play an important role for economic and environmental policy making.

Keywords: Renewable resources, Transitional dynamics, Optimal growth rate

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