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Neoclassical growth model and natural capital dynamics

Within the economics of sustainable development, many works of both theoretical and empirical nature have been developed. However, the dominant approach is the methodology of neoclassical economics, including the use of traditional long-term growth models for modelling the relationship between the economy and the natural environment. In the paper we examine the dynamics of the standard Solow growth model extended by the presence of natural capital being modelled in the form of an aggregated renewable resource. The dynamics of the economy is studied and conditions for existence of equilibria is provided. The role of the technological progress and investment in protection of natural capital is considered. Later we study the neoclassical model of Ramsey with similar extension, where the utility is optimized over the infinite horizon. Analyzing the model in neoclassical setting we arrive to conclusions that are essentially in line with the postulates of ecological economics — preserving natural capital at a constant level requires maintaining a constant level of consumption which in turn is determined by environmental conditions.

References

- [1] M. Kornafel, I. Telega, *Neoclassical growth model and natural capital dynamics*, submitted.