

Theoretical Basis for Sustainable Growth

Assaad Ghazouani

University of Jendouba, FLEMJ\LVPNC\CEDIMES

Email: assaad.ghazouani@fsjegj.rnu.tn

Abstract: The notion of sustainable growth has become central to academic and political debates, in the face of global challenges such as climate change, scarcity of natural resources and socio-economic inequalities. Traditional growth models, based on intensive resource exploitation and short-term GDP maximization, are showing their limits. Sustainable growth aims to meet current needs without compromising those of future generations, by integrating economic, environmental and social dimensions. The model presented uses an optimal control approach to maximize total discounted utility from consumption C_t , under constraints related to capital dynamics K_t and the use of an exhaustible resource R_t . The production function $F(K_t, R_t)$ depends on capital and resource, with constant returns to scale. The resource stock S_t decreases at the rate of its exploitation, and the objective is to maximize social welfare over an infinite horizon

Keywords: Sustainable Growth, Optimal Control, Resource Management, Environmental Sustainability

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