

Intergenerational sustainability and capital overshooting

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Abstract: Sustainability is a feasibility question; can future generations attain at least the same living conditions (utility) as current generations? Generations are interlinked via the various stocks of capital - including real capital, human capital, natural capital - which one generation leaves for the next generation. This paper considers the sustainability question in an overlapping generations model where the finite horizon of households allows an explicit analysis of generations and how the stocks of capital and lifetime utilities evolve across time. Specifically, it is thus possible to assess whether the economy develops along a path which at first is sustainable in the sense that the lifetime utility of any generation is larger than for the preceding generation, and then at some point enters an unsustainable path. We analyse an otherwise standard overlapping generation model amended with natural capital following the approach proposed by Dasgupta (2021) and consider the equilibrium trajectory of the economy and whether it is sustainable. This trajectory is also compared to both the Golden Rule allocation and the optimal trajectory under a utilitarian social welfare function. We show that the market outcome will likely result in a scenario with capital overshooting, meaning that nature will be (over)-depleted in return for (too much) physical capital. This happens in the market outcome because agents do not consider the negative externality on production of depleting nature. Nor do they consider the effects on future generations. This scenario will result in an increasing capital stock and welfare – until at some point welfare and capital starts to decrease and the economy begins to move along an unsustainable path before stabilising at an equilibrium lower – in terms of welfare – than the preceding generations.