

Discounted optimal growth in the two-sector RSS model: a geometric investigation

M. Ali Khan¹ and Tapan Mitra²

¹ Department of Economics, The Johns Hopkins University, Baltimore, MD 21218

² Department of Economics, Cornell University, Ithaca, New York 14853

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Abstract. This paper initiates a comprehensive investigation of discounted optimal growth in the two-sector RSS model as a specific instance of the general theory of resource allocation associated with Brock, Gale and McKenzie. For an interval of values of a parameter ξ formalizing the marginal technical rate of transformation, under zero consumption, of machines from one period to the next, we show that the optimal policy in the discounted case remains identical to that in the undiscounted case irrespective of the discount factor. For two particular cases of ξ outside the said interval, we give a complete characterization of the optimal policy function, and of a variety of subsets that extend the facet notions formulated by McKenzie. Methodologically, this essay is a further rehabilitation of the geometric apparatus introduced by the authors for the undiscounted case.

Key words: RSS model, irreversible investment, modified golden-rule stock, golden-rule prices, value-loss lines, cycling, von-Neumann facet, McKenzie facet, m_i -facet, v_i -facet, transition dynamics, optimal policy function