DUAL MULTIPLIER-ACCELERATOR INTERACTIONS IN INCOME DETERMINATION MODELS

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The classic multiplier-accelerator model, which was built by Samuelson (1939) following a suggestion by Hansen, may justly be considered as the pioneer of all multiplier-accelerator models of income determination and business cycles. The "ingredients" of such models are a consumption function, an investment function (in which both induced and autonomous appear) and the relation, which defines the equilibrium value of income.

The objective of this study is to investigate the time path of the income function Y_t and the nature of the stability of an income determination model when the consumption function, C_t is strictly, partially proportional to the Y_t and Y_{t-1}, and autonomous investment is a periodic function of the type $|\sin \pi t|$, and to estimate upper bounds for the endogenous parameters a (marginal propensity to consume for the national income in the current year $= MPCC$) and b (marginal propensity to consume for the national income in the previous year $= MPCL$). This is a generalization of the classic income determination model of Samuelson (1939).

The model under discussion is mathematized as follows:

(1) $C_t = aY_t + bY_{t-1}$, where a and b are two constants such that $0 < a,b < 1$.

(2) $I_t = I_t^{/} + I_t^{//}$, where I_t is total investment.

(3) The autonomous investment, $I_t^{//} = G + \alpha|\sin \pi t|$, where G and α are positive constant.

(4) The induced investment, $I_t^{/} = k(C_t - C_{t-1})$, where k is the acceleration coefficient; this is the acceleration principle.

(5) The equilibrium condition is $Y_t = C_t + I_t$.

(6) The governing equation of the model is, $[1 - a(1+k)]Y_t + [ak - b(1+k)]Y_{t-1} + bkY_{t-2} = G + |\sin \pi t|$

By solving (6) for Y_t, upper bounds are obtained for a and b in terms of k for the model to be stable and it is noted that this model demonstrates more possibilities of generating business cycles than the classic multiplier-accelerator model.