

A Portfolio Balance Model of the Open Economy*

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I. Introduction

This paper develops a framework in which to investigate the effects of macroeconomic policies. The key building blocks are those of Metzler (1968, 1973) in the form of a wealth saving relation and the emphasis on portfolio considerations; the model in its dynamic aspects is extended in a manner suggested in the work of *Foley/Sidrauski* (1971) and *Mussa* (1973), where the asset accumulation implied by short-run equilibrium is pursued over time.

A large body of literature on the implications of asset mobility for macroeconomic policy has been accumulated during the last decade. Following the work of *Mundell* (1968) on capital mobility and the policy mix, that literature has primarily taken a perspective of stabilization policy and therefore espoused a short-run view of the economy in describing it in terms of the IS-LM model – more or less appropriately modified – to accommodate the openness of the economy and the mobility of assets.¹ Alternative routes with a longer time perspective, though still maintaining the assumption of a perfectly elastic supply of output at current prices, have been offered by *McKinnon* (1969), *Tower* (1972) and *Branson* (1972).

The approach taken here assumes flexibility of relative prices, full employment and continuous market clearing, thereby assuming away a host of interesting short-run problems and substituting a set of issues that center on the time path of the economy, the endogeneity of asset supplies and the long-run effects of policies.²

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¹ For a recent survey, see *von Neumann-Whitman* (1970). Earlier literature includes Jones (1968), *McKinnon/Oates* (1966), *Roper* (1969) and *Swoboda* (1972).

² For work along these lines, see for example *Allen* (1972), *Boyer* (1971), *Frenkel* (1970), *Lee* (1972) and *Mussa* (1971).

In sections 2 and 3 of this paper the basic model and its equilibrium properties are developed. Section 4 considers three applications of the model, and in section 5 some observations on possible extensions and limitations of the model are offered.

II. The Model

The home country produces two commodities, consumption goods and investment goods, and technology is described by the standard neoclassical two-sector model with capital goods labor-intensive.³ The labor force is assumed constant and capital depreciates at a constant exponential rate. With this specification the flow (supply) of physical net investment, \dot{K} , is a function of the relative price of capital in terms of consumption goods, q , and the stock of real capital, K . Furthermore, by the Stolper-Samuelson theorem the relative price of capital is inversely related to the yield on real capital, r , so that we can write the rate of investment as a function of the yield on capital and the stock of capital,⁴

$$(1) \quad \dot{K} = \dot{K}(r, K), \quad \dot{K}_r < 0; \quad \dot{K}_K < 0.$$

To each rate of interest there exists a corresponding stock of capital, \bar{K} , such that net investment is zero ($\dot{K} = 0$),

$$(2) \quad \bar{K} = \bar{K}(r), \quad \bar{K}_r < 0.$$

The value of investment, I , and the capital stock, k , measured in terms of consumption goods is defined in (3) and (4),

$$(3) \quad I \equiv q\dot{K} = I_r < 0; I_K < 0,$$

$$(4) \quad k \equiv qK = k(r, K), \quad k_r < 0; k_K < 0,$$

and substituting (2) in (3) defines the steady state value of the capital stock, \bar{k} , as a reduced form function of the yield on real capital.⁵

$$(5) \quad \bar{k} = \bar{k}(r), \quad \bar{k}_r < 0.$$

³ The structure of the two-sector model is readily available in various places and hence is dealt with briefly here. See, for example, *Foley/Sidrauski* (1971).

⁴ We assume that capital accumulation is exclusively financed by the issue of equity – one share per unit of physical capital.

⁵ Throughout this paper a bar over a variable denotes its steady state value.