

Capital accumulation with tangible assets[☆]

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Abstract

The paper develops a neoclassical growth model with capital accumulation and a retradable tangible asset in an overlapping generations framework. It analyzes its effect on the dynamics of capital accumulation. Two period lived consumers hold portfolios consisting of real capital and the tangible asset. It is shown that the possibility of trading the tangible asset as an alternative to capital may cause the coexistence of stable steady states with high and low levels of capital and with disjoint basins of attraction. Thus, the so-called poverty trap may appear purely endogenously generated as a consequence of asset trading alone. The possibility of the occurrence of the poverty trap is reduced as factors of production become more substitutable. However, the result is robust for continua of homogeneous as well as heterogeneous consumers.

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1. Introduction

Widely observed poverty and its persistence in developing countries has motivated much of theoretical research to examine the reasons why countries with similar structural characteristics may converge to different equilibria in the long run. A common key feature of models deriving the so-called poverty trap¹ is its self-perpetuating or self-reinforcing nature (i.e. economies will remain poor only because they are poor). Thus, poverty becomes its own cause and, most likely, countries are unable to escape the trap without any external assistance. In technical terms models with a poverty trap are characterized by the coexistence of stable steady states at high and low levels of income with disjoint basins of attraction. Therefore, convergence to these steady states depends on the initial capital stock.

Several plausible self-reinforcing mechanisms have been suggested in the literature through which initial conditions can determine the future evolution of an economy. One good illustration of how multiple steady states can emerge is provided by the presence of externalities associated with human capital formation. Various economic models have

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¹ Examples include Banerjee and Newman (1993), Galor and Zeira (1993), Dercon (1998), and Mookherjee and Ray (2002, 2003); see also Azariadis and Stachurski (2004) or Carter and Barrett (2006) for reviews of the poverty trap literature.

shown indeed that identical countries with different initial human capital may cluster around different equilibria. This can happen either as a result of a threshold externality in human capital as in Azariadis and Drazen (1990) or from imperfections in the credit market as in Galor and Zeira (1993). Financial underdevelopment was identified as another reason for a poverty trap in Saint-Paul (1992) and in Acemoglu and Zilibotti (1997). As these authors argue, the limited opportunity to diversify risk discourages entrepreneurs to make productive but risky investment. This leads to a limited set of traded financial instruments, and consequently it reduces the opportunity of risk diversification. Other structural reasons causing the economy to suffer from a poverty trap are summarized in Matsuyama (2008).

In this paper we reveal an additional mechanism that may cause a poverty trap to occur. Specifically we investigate the question whether the availability of a tangible asset as a portfolio opportunity to real capital investment can affect the dynamics of capital accumulation. The classical examples of such tangible assets are real estate, land, jewelry, gold, antique furniture, rare stamps, rare coins, oriental rugs, and other durable commodities.² As pointed out by Meier and Baldwin (1957, pp. 307–308), Myrdal (1956, pp. 202–203), Rosenberg (1960), and Wolff (1987), the existence of such an asset can be an obstacle to capital formation. The economic intuition of the mechanism is that the incentives of individual portfolio choice with tangibles as alternatives to real capital does not necessarily imply an investment in real capital for the economy as a whole when there is intertemporal trading among agents. In spite of the fact that consumers regard the acquisition of an asset as a form of personal saving and investment, the income spent on assets is diverted to consumption of those who use the asset as a store of value for ultimate consumption. Thus, the asset market induces an income redistribution between asset holders of succeeding generations, withdrawing funds from real investment. In other words, the introduction of a market for a tangible asset does not necessarily add to a society's supply of aggregate savings for real investment. To the extent that such an asset is used as a store of value to finance old consumption, it (actually crowds out savings that might otherwise have been used to finance capital formation).

The role of a market of a productive asset on the dynamics of capital accumulation has been addressed in Böhm et al. (2006). There the asset is modelled as a regular share or equity of a producer with random dividend payments that originate from production shocks to a Cobb–Douglas technology. Consumer preferences are described by the CARA utility function, while the production shock is known and generated by the Gamma distribution. It is shown that the existence of an asset market can increase the number of stable steady states in the economy where one is associated always with zero capital. Thus, the asset crowds out physical capital completely. For sufficiently low initial capital, the economy will eventually converge to the steady state with zero capital. This happens despite the fact that the return on capital becomes unbounded. The force bringing the economy to the zero steady state is that for sufficiently low capital, the asset return increases so sharply that it becomes dominant to the return on capital investment. This creates an incentive for consumers to invest all of their wage income in the asset market as soon as the capital stock in the economy is sufficiently low. Consequently, the existing capital stock starts to deteriorate and declines eventually to zero.

This paper presents generalizations of these results in three directions. First, the results are derived for a simpler, non-stochastic economy with full depreciation of capital. Both assets are always valued positively, boundary steady states do not occur, and there is no need for randomness. Second, the occurrence of multiple steady states is shown to exist for the CES production function leading to *interior* long run levels of capital (in contrast to the findings in Böhm et al.). In addition, the role of factor substitution is studied for the existence of the poverty trap. Third, the results are shown to hold for a continuum of heterogeneous consumers. Thus, diversity of portfolio choices among consumers do not preclude the above effects.

The paper is organized as follows. Section 2 introduces the model with a simpler, analytically tractable structure, capable of capturing the effect of the tangible asset on the dynamics of capital accumulation. Section 2.3 demonstrates the existence of a rational expectations equilibrium with and without an asset market. Section 2.4 discusses the dynamics of the economy and the possibility of the poverty trap. In Section 3 we show that the result of the model persists when consumers are heterogeneous. Section 4 concludes.

² Indeed in most developed countries, consumers hold a significant part of their wealth in such tangible assets. For example, by 2001, this number was 40 percent for US households.

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