Widely Diversified Macroeconomies in the Super-Long Run Casts a Doubt on Path-Independent Equilibrium Growth Model

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Abstract : One of the major assumptions of mainstream macroeconomics is the path independence of capital stock. This paper challenges this assumption by employing an agent-based approach. The simulation results showed the existence of multiple "quasi-steady state" equilibria of the capital stock, which may cast serious doubt on the validity of the assumption. The finding would give a better understanding of many phenomena that involve hysteresis, including the causes of poverty. The "market-clearing view" has been widely shared among major schools of macroeconomics. They understand that the capital stock, the labor force, and technology, determine the "full-employment" equilibrium growth path and demand/supply shocks can move the economy away from the path only temporarily: the dichotomy between the short-run business cycles and the long-run equilibrium path. The view then implicitly assumes the long-run capital stock to be independent of how the economy has evolved. In contrast, "Old Keynesians" have recognized fluctuations in output as arising largely from fluctuations in real aggregate demand. It will then be an interesting question to ask if an agent-based macroeconomic model, which is known to have path dependence, can generate multiple full-employment equilibrium trajectories of the capital stock in the super-long run. If the answer is yes, the equilibrium level of capital stock, an important supply-side factor, would no longer be independent of the business cycle phenomenon. This paper attempts to answer the above question by using the agent-based macroeconomic model developed by Takahashi and Okada (2010). The model would serve this purpose well because it has neither population growth nor technology progress. The objective of the paper is twofold: (1) to explore the causes of long-term business cycle, and (2) to examine the super-long behaviors of the capital stock of full-employment economies. (1) The simulated behaviors of the key macroeconomic variables such as output, employment, real wages showed widely diversified macro-economies. They were often remarkably stable but exhibited both short-term and long-term fluctuations. The long-term fluctuations occur through the following two adjustments: the quantity and relative cost adjustments of capital stock. The first one is obvious and assumed by many business cycle theorists. The reduced aggregate demand lowers prices, which raises real wages, thereby decreasing the relative cost of capital stock with respect to labor. (2) The long-term business cycles/fluctuations were synthesized with the hysteresis of real wages, interest rates, and investments. In particular, a sequence of the simulation runs with a super-long simulation period generated a wide range of perfectly stable paths, many of which achieved full employment: all the macroeconomic trajectories, including capital stock, output, and employment, were perfectly horizontal over 100,000 periods. Moreover, the full-employment level of capital stock was influenced by the history of unemployment, which was itself path-dependent. Thus, an experience of severe unemployment in the past kept the real wage low, which discouraged a relatively costly investment in capital stock. Meanwhile, a history of good performance sometimes brought about a low capital stock due to a high-interest rate that was consistent with a strong investment.

Keywords : agent-based macroeconomic model, business cycle, hysteresis, stability

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