SECULAR GROWTH IN GARRISON'S MODEL: A COMMENT

Nicolás Cachanosky

ABSTRACT: I comment on the controversy around Garrison's secular growth, with special emphasis on Murphy's contribution in this issue. I also argue that further research on this area should focus on formally connecting Garrison's model with neoclassical growth theory.

KEYWORDS: business cycle, Austrian School, Garrison

JEL CLASSIFICATION: B53, E32

1. INTRODUCTION

There has been an ongoing debate for some time now on whether or not (Garrison, 2001) secular growth is consistent with neoclassical growth theory, in particular with Solow's model (Engelhardt, 2009; Salerno, 2001; Young, 2009a, 2009b). Murphy's paper included in this issue is the latest contribution on this issue. This short comment clarifies the issue and some of the arguments involved. First, I present the controversy around Garrison's secular growth. Then I comment on Murphy's counter-examples. Finally,

Nicolás Cachanosky (ncachano@msudenver.edu) is assistant professor of economics at Metropolitan State University of Denver.

I offer a short reflection on how to move forward with respect to growth and Garrison's model if the intention is to engage the neoclassical literature.

2. THE CONTROVERSY

Garrison (2001, p. 54) presents the case of secular growth in the following way (italics added):

> While a no-growth economy allows for the simplest and most straightforward application of our graphical analysis, an expanding economy is the more general case. Secular growth occurs *without* having been provoked by policy or by *technological advance* or by a *change in intertemporal preferences*. Rather, the ongoing gross investment is sufficient for both capital maintenance *and capital accumulation*.

The objections to Garrison's exposition rest on understanding "secular growth" as a long-run phenomenon. This contrasts with the well know result of Solow's model that in the *long-run* the economy grows at the rate of total factor productivity (TFP). The main reason for this is that capital presents diminishing marginal returns *and* there is a constant depreciation rate. These plausible assumptions mean that in a growing economy, eventually the capital stock is just too large for the marginal productivity of capital to replace and increase the stock of capital. Given consumers' time preference, the economy can just replace the depreciated capital. This is the stationary (equilibrium) point. Salerno (2001) argues that Garrison's secular growth is inconsistent and is implicitly making use of questionable assumptions. Young (2009a) rests on Solow's model to argue that Garrison's position is inconsistent. Engelhardt (2009) and Murphy's paper hold the opposite position, arguing that there is a case for secular growth in capital based macroeconomics.

2.1. From Engelhardt-Young to Murphy

Contra Young (2009a), Engelhardt (2009) argues that all that is needed for secular growth to be possible is that "some form of nondepreciating capital is produced" (p. 60.) For instance, intangible capital or ideas are not forgotten after being produced (a form of nondepreciating capital) (pp. 61–62). However, Young (2009b)

points out that Engelhardt's argument requires us to assume not only nondepreciating capital, but also constant marginal returns on capital. Even without depreciation, decreasing marginal returns means that the growth of output converges to zero. In other words, Engelhardt's argument implies that Garrison's secular growth is the analogous to the AK model in neoclassical growth theory. The distinctive characteristic of the AK model is that capital depicts constant marginal returns.

Murphy argues that Young's position falls once we consider the time involved when there is no capital depreciation. Because of this, Murphy argues, neoclassical economists may side with Garrison's secular growth rather than Salerno's and Young's objection. Murphy's objection to Young rests on a different under-standing of secular growth. In Murphy's treatment, secular growth is a short-run (in the economic sense) phenomenon even if it is a long-term period on the eyes of economic agents. Consider, for instance, the use of the term "secular stagnation" to describe a long-term period of lack of economic growth. Therefore, before reaching the steady state, the existing capital stock might be enough to both maintain and accumulate capital. If this is the case, most of the controversy surrounding Garrison's secular growth is built on a semantic misunderstanding. But, Murphy's examples show that there may be more than just semantic quibbles. His examples show how scenarios of secular growth are still possibly consistent with neoclassical growth theory.

3. MURPHY'S SCENARIOS

The first example given by Murphy is the more counterintuitive one. In Solow's model, capital shows diminishing marginal returns at the same time that capital depreciates at a constant rate. What Murphy is showing is that by assuming a zero depreciation, then net investment changes in a way that secular (meaning perpetual) growth is possible. If there is no need to allocate a portion of the savings to maintain capital, then the capital stock grows exponentially at a rate that perfectly compensates for the diminishing marginal returns of capital. Because of this, output can grow indefinitely at a constant absolute rate. Note that output depicts diminishing returns to capital but constant returns over

time (because of the exponential growth of capital over time). As Murphy recognizes, this scenario is not the most interesting one. To assume a zero-depreciation rate for all capital is implausible. Even if intangible capital presents no depreciation, as long as there is some physical capital with a positive depreciation rate, the total capital stock will have a positive depreciation rate. The role of this example is to show the effect on capital accumulation when the depreciation rate is assumed to be zero.

Murphy's second example assumes a positive depreciation rate for capital stock. It is in this scenario where the semantic issue of defining "secular" growth becomes important. As long as there is a depreciation rate, then the capital stock cannot grow fast enough to maintain a constant growth of output with respect to time. Without a depreciation rate, there is no steady state. But in scenario two, there is a steady state and therefore growth cannot be perpetual without TFP increases. However, if the time required to reach the steady state is *long enough*, then such situation could be described as *secular* growth. This, of course, requires an arbitrary definition of how long is too long. This is why is important to understand secular growth as something different than perpetual growth.

It is possible that Garrison has in mind a similar definition to Murphy's. Chapter 4 (p. 57) in Garrison's book starts the following way: "Secular growth characterizes a macroeconomy for which the ongoing rate of saving and investment exceed the rate of capital depreciation." This definition, however, comes *after* the discussion of the case of secular growth (pp. 54–56). The discussion in the secular growth section invites the interpretation that Garrison might be talking about perpetual growth. Certainly, neither Young nor Salerno nor Engelhardt can be blamed for misunderstanding Garrison.

4. WHAT TO DO NEXT, IF ANYTHING?

Whether or not Austrian business cycle theory academic research should be based on a pedagogical tool as Garrison's model is open to debate. However, taking as given the use of Garrison's model, what can be done next in terms of compatibility with neoclassical growth theory?

Rather than focus on semantic disputes, an actual expansion of Garrison's model to account for different growth models would be more fruitful both in terms of theoretical and empirical studies. This, however, requires to follow a path that may look "un-Austrian," which consists in formally representing Garrison's model (Cachanosky and Padilla, 2016). This formal representation of Garrison's model, however, is not that far away from what is already being done in this line of research. The mere fact of using Garrison's graphical model means that the equations behind the graphs are also being endorsed. A mathematical version of Garrison's model is the other side of the graphical version of Garrison's model. But the mathematical side of the model allows for a more flexible exposition of a more complex model for which a set of graphs may be too restrictive.

By adding time and a neoclassical production function, Garrison's model is connected with a simple growth model. For instance, a Solow-Garrison model can track what happens to the Hayekian triangle and the stages of production when the Solow model faces different shocks (growth in TFP, changes in time preference, etc.). Conversely, it allows us to see what happens to the Solow model if there is a monetary policy that puts into motion unsustainable growth. The following natural step to engage the neoclassical literature would be to illustrate the insight of a Solow-Garrison model with empirical research. This is just an example of how the controversy around Garrison's secular growth may lead to new research originating in Garrison's important contribution.

REFERENCES

Cachanosky, Nicolás, and Alexandre Padilla. 2016. "A Mathematical Version of Garrison's Model," *Quarterly Journal of Austrian Economics* 19, no. 3: 225–247.

Engelhardt, Lucas M. 2009. "Comment on 'A Capital-Based Theory of Secular Growth,'" *Quarterly Journal of Austrian Economics* 12, no. 2: 60–62.

Garrison, Roger W. 2001. *Time and Money. The Macroeconomics of Capital Structure*. In Mario J. Rizzo and Lawrence H. White, eds., 2nd ed. London and New York: Routledge.

Salerno, Joseph T. 2001. "Does the Concept of Secular Growth Have a Place in Capital-Based Macroeconomics?" *Quarterly Journal of Austrian Economics* 4, no. 3: 43–61.

Young, Andrew T. 2009a. "A Capital-Based Theory of Secular Growth," *Quarterly Journal of Austrian Economics* 12, no. 1: 36–51.

——. 2009b. "A Capital-Based Theory of Secular Growth: Reply to Engelhardt," *Quarterly Journal of Austrian Economics* 12, no. 2: 63–67.