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A DEVELOPMENT OF THE THEORY OF THE RICARDO EFFECT

PHILIP RUYLS

ABSTRACT: According to Hayek's "theory of the Ricardo Effect" there is a "decline of investment" on the part of the consumer goods industries that starts halfway through the cyclical upswing. This "decline of investment" then gradually leads to the "scarcity of capital" in the consumer goods industries, which is the proximate cause of the upper turning point. This thesis was hardly made convincing by Hayek. I develop the theory of the Ricardo Effect by rebuilding it around the alternative theses that a decline of investment by both the machine producing industries and the raw materials industries leads to the "scarcity of capital."

KEYWORDS: Ricardo Effect, Austrian Business Cycle Theory, upper turning point, circularities, structure of production

JEL CLASSIFICATION: D24, D25, E14, E22, E32, E51, G31

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1. INTRODUCTION

The concrete thesis in Hayek's theory of the Ricardo Effect is that the business cycle's upper turning point is brought about by a decline of investment in fixed capital on the part of the consumer goods industries, a decline that starts during the upswing. To Hayek, the upswing begins with a credit-induced "acceleration effect," a somewhat exaggerated demand for machinery by the consumer goods industries. Roughly halfway through the upswing, falling real wages make investment in machinery less attractive. This is the "Ricardo effect," which counteracts the acceleration effect. The decline of investment, on the part of the consumer goods industries, commences. Labor is reallocated from the machine producing industries to the consumer goods industries, because the funds destined for capital expenditure are reallocated to additional operating expenditure. There is increased capital utilization in the consumer goods industries in the latter half of the upswing, which initially strengthens the boom. However, the decline of investment leads in the longer run to a crisis, because machines in the consumer goods industries are not replaced once worn out, or only replaced by less-labor saving machinery. This eventually causes a diminished productive capacity in the consumer goods industry, a "scarcity of capital." The decline in investment spending leads, of course, also to a slump in the machine producing industries.

Hayek's thesis that a decline of investment by the consumer goods industries would take place, starting roughly halfway through the upswing, was hardly made convincing by him. His theory of the Ricardo Effect has generally not been well received (Klausinger, 2012, pp.15–24). I also believe that this concrete thesis is largely incorrect. But when Hayek's theory of the Ricardo Effect is looked upon more broadly than by just focusing on this concrete thesis, I believe it contains a lot of material that would support an alternative thesis that very much resembles Hayek's thesis.

In this paper I develop Hayek's theory of the Ricardo Effect by rebuilding that theory around the alternative thesis that a decline of investment by the machine producing industries leads to the "scarcity of capital." This means to visualize the Ricardo Effect not as an economy-wide shift of workers from the machine producing industries towards the consumer goods industries,

but as a re-allocation of productive capacity within the machine producing industries itself. Instead of the “acceleration effect” becoming dominated by the “Ricardo effect” in the second half of the upswing, I will twist Hayek’s argumentation a bit. I will argue that the “acceleration effect,” which emanates from one half of the economy (the consumer goods industries), gives rise to the “Ricardo effect” in the other half of the economy (the machine producing industries). I will also attempt to demonstrate a secondary thesis on top of this primary thesis. This secondary thesis is that, because the “acceleration effect” causes the machine producing industries’ capacity to become fully employed, continued credit expansion will lead, somewhere halfway the boom, to increasing operating expenditure by all industries. This increasing operating expenditure will drive towards a Ricardo Effect in the raw materials industries, causing an increasing scarcity of “circulating capital,” and finally flipping over the upswing into the downswing.

The rest of this paper is organized as follows. In the following section I will summarize Hayek’s theory of the Ricardo Effect with more detail than in this introduction. Here I will also highlight the main points of the debate over the Ricardo Effect in the early 1940’s, and I will highlight the main capital-theoretic problem that Hayek deals with in his theory of the Ricardo Effect. In the third section following that, I provide a list of points on which my development of the theory of the Ricardo Effect originates in Hayek’s theory. The fourth section can be seen as the core of this paper. It deals with a conceptual difficulty of the stages-of-production model that Hayek recognized in his theory of the Ricardo Effect ([1935] 2012, pp. 223–226). The difficulty is that of so-called “circularities” in the structure of production, in particular how to model these circularities verbally or graphically. Hayek did not really resolve this difficulty and I will attempt to do so by re-examining the capital-theoretic issue of combining the intertemporal stages-of-production viewpoint with the cross-sectional viewpoint that divides the economy into a consumer goods industries and a machine producing industries. Here I propose a new type of cross-sectional model that should better help understand the near-future/distant-future trade-offs. In section five I will argue in detail for my primary thesis and therefore go into the reasons why a Ricardo Effect (i.e. a decline

of investment) would occur within the machine producing industries during the boom. In the sixth section I will come to my secondary thesis, and I will argue that the increased capital utilization that appears during the boom leads to a Ricardo Effect in the raw materials industry. Hereto I will extend the cross-sectional viewpoint that divides the economy into a consumer goods industries and a machine producing industries with the raw materials industries as a third sector.

2. A SUMMARY OF HAYEK'S THEORY OF THE RICARDO EFFECT AND ITS PROBLEMS

2.1 Hayek's Revised Business Cycle Theory

In *Profits, Interest and Investment* ([1939] 2012) and "The Ricardo Effect" ([1942a] 2012) Hayek published what may be called his "theory of the Ricardo Effect" (Wilson, 1940, p.171).¹ *Profits, Interest and Investment* was partly a revision of his business cycle theory of *Prices and Production* ([1935] 2008) in order to provide a more detailed explanation of the upper turning point of the business cycle. Hayek identified as a main difference with his earlier explanation of crises that in his "revised version" he believes that "a rate of profit rather than a rate of interest is the dominating factor in this connection" ([1939] 2012, p. 212). Hayek would initially assume the rate of interest as given, which apparently implies that the supply of credit is simply "elastic" and that there is a credit expansion going on throughout the upswing (ibid., p. 230). Hayek attempts to demonstrate that "the turn of affairs will be brought about in the end by a "scarcity of capital" independently of whether the money rate of interest rises or not" (ibid.). Professor Klausinger has explained the importance of these revised aspects:

The new features of the model—in comparison to *Prices and Production*—are crucial for the novel explanation of the upper turning point. For

¹ Apart from these two essays Hayek's theory of the Ricardo Effect can also be seen to be restated in two short replies to Kaldor ([1942b] 2012). Also, without using the term "Ricardo Effect," Hayek raised similar points in chapter XXVII of *The Pure Theory of Capital* ([1941] 2009) and in "Full Employment Illusions" ([1946] 2009). Then he returned to the issue roughly a quarter of a century later in "Three Elucidations of the Ricardo Effect" ([1969] 2012).

without an elastic supply of credit and with the circulation of money limited, eventually the rate of interest would rise sufficiently to choke off investment demand [...] what Hayek is now attempting to demonstrate is the inevitability of the breakdown of an inflationary boom, even [...] with unlimited credit creation and with less than full employment. (2012, p. 17, footnote omitted.)

Because Hayek would concentrate on the latter half of the upswing, he was brief about the first half. He simply asserted that in the first half of the upswing, credit expansion and increasing consumer spending would give incentives to the consumer goods industries to order more machinery. This more or less exaggerated 'derived demand for machines' Hayek called the "acceleration effect," following the terminology of "a well known doctrine, the so-called 'acceleration principle of derived demand...'" (Hayek, [1939] 2012, pp. 222–223). However, Hayek did not quite follow that doctrine itself till the end.

Hayek assumed that "at a point somewhere half-way through a cyclical upswing [...] prices of consumers' goods do as a rule rise and real wages fall" (ibid., p. 217). On this Hayek builds his concrete thesis: At this halfway point the incentives for entrepreneurs are strong enough to:

...make the tendency to change to less durable and expensive types of machinery dominant over the tendency to provide capacity for larger output. Or, in other words, in the end "the acceleration principle of derived demand" becomes inverted into a "deceleration principle..." (ibid., p. 231)

Besides calling this weakening 'derived demand for machines' simply a "decline of investment" (ibid., p. 230), Hayek also calls this tendency the "Ricardo effect." In short, the "acceleration effect" dominates the first half of the upswing, the "Ricardo effect" the second half.

Hayek's visualization of this Ricardo Effect is that while the consumer goods industry decreases its capital expenditure, it will start to increase its operating expenditure. Workers are then re-allocated from the machine producing industries towards the consumer goods industries. Fewer machines, or "less durable and expensive types of machinery," are manufactured in the machine

producing industries, while machine-utilization in the consumer goods industries goes up ([1942a] 2012, pp. 275–276). However—this seems to be Hayek’s point—higher machine-utilization can only sustain higher output for as long as those machines are not yet worn out. Since less machines are manufactured to replace worn-out machinery, there must come a point at which that higher output cannot be maintained. The decline of investment results in a decreased productive capacity, and “the classical maxims that a scarcity of capital means a scarcity of consumers’ goods [...] assert their fundamental truth” ([1939] 2012, p. 231). The relationship to the business cycle of this theory of the Ricardo Effect is that this “scarcity of capital” becomes the *real* reason why the high level of output during the boom-phase cannot be sustained (ibid., pp. 230–232). The upswing must reach a “turn of affairs” (ibid.). Besides this, the decline of investment by the consumer goods industries would, of course, also lead to a slump in the machine producing industries.

2.2 The Debate on the Theory of the Ricardo Effect

The debate² that followed, between Wilson (1940), Hayek ([1942a] 2012) and Kaldor ([1942] 2012), centered around the rather micro-economic question of what firms in the consumer goods industries would do under the circumstances that Hayek described. Wilson compared Hayek’s thesis, that “with a perfectly elastic supply of credit, a fall in real wages will lead to the adoption of less roundabout methods of production,” to a treatment of a similar case by Kaldor (Wilson, 1940, p. 173). To Kaldor, a representative firm would combine, in the words of Wilson, “direct labour and indirect labour [...] in the same proportion as before; the change in prices will change the scale of output but leave the degree of capital intensity unchanged” (ibid., p. 174; cf. Kaldor, 1939, pp. 49–50). Kaldor’s conclusion was that the method of production (i.e. the ratio of direct to indirect labor) at which profits are maximized, in the case of elastic

² Other summaries of the debate can be found in Haberler (1943), Blaug (1997) and Klausinger (2012). Klausinger (2012) is the introduction to the 8th volume of Hayek’s *Collected Works* in which most of the theory of the Ricardo Effect can be found. Klausinger (2011) provides some more background to the debate. For example, Wilson, Kaldor, and Hayek were all attached to the London School of Economics during the debate, Kaldor being Wilson’s thesis supervisor.

credit, will be entirely determined by the interest rate. The real wage rate has no influence. The reason is that falling real wages (selling prices that go up relative to money wages) do not affect the initial costs (expenses on wages for indirect labor plus interest charges) of each different method of production (Wilson, 1940, p. 177). Hence, under elastic credit and falling real wages, such a representative firm would not change its “ratio of indirect to direct labour” (*ibid.*, p. 176). But it would hire more indirect labor and direct labor in the same proportion as it did before. In other words, it would purchase more machines similar to what it already has, and also hire more workers to man those machines. The representative firm enlarges its scale of operations by “capital widening.” With respect to the consumer goods industries as a whole, this means that maximum aggregate profits are achieved when each consumer goods firm enlarges the scale of operations on its particular profit-maximizing “ratio of indirect to direct labour” until for each firm marginal revenue will have equaled marginal costs (*ibid.*; cf. Klausinger, 2012, p. 19). In the aggregate of the consumer goods industries this means, as Professor Klausinger has explained, that “the increased demand for consumers’ goods will bring forward ‘capital widening’ but no ‘capital enshallowing’...” (Klausinger, 2012, p. 19). Wilson pointed to the crucial role of Hayek’s assumption of a perfectly elastic supply of credit, which would play an important role in the rest of the debate. Even if that assumption is dropped, Hayek’s thesis would not stand, according to Wilson. Under a rising supply schedule of credit, he argued, an increase in consumption may diminish capital intensity (there will be less use of indirect labor relative to direct labor), but it will not lead to a fall in investment (less use of indirect labor in the absolute) (*ibid.*).

Hayek subsequently defended his case in “The Ricardo Effect” ([1942a] 2012). Instead of discussing a choice among a number of different ratios of indirect to direct labor, Hayek now built his argument on the more practical idea that entrepreneurs must choose between “expenditure on wages (or investment in ‘circulating capital’) and expenditure on machinery (investment in ‘fixed capital’)” (*ibid.*, p. 262).³ Hayek maintains that in the upswing at

³ Increasing capital utilization is not exactly the the same as increasing the ratio of direct to indirect labor (i.e., decreasing the “ratio of indirect to direct labour”). The former means that existing machines will be utilized more intensely, the latter

some point entrepreneurs prefer to use their funds to increase output by increasing the utilization of their existing capacity rather than by purchasing more capacity. The obvious objection against Hayek's line of argumentation was raised by Hayek himself: "To this it will no doubt be answered that there is no reason why the entrepreneurs should not do both: provide for the output in the near future by the quick but expensive methods *and* provide for the more distant future by ordering more machinery" (*ibid.*, p. 278). Kaldor indeed responded in such a way:

When the price of a product rises (or strictly: the *expected* price of the product rises) it becomes profitable to increase output, and to extend output-capacity, until the expected price, or the marginal revenue, is back again to conformity with cost. As Ricardo said: "an unusual quantity of capital would be employed till their price afforded only the common rate of profit" ([1942] 2012, p. 296)

Hayek must show what is precisely that thing that propels entrepreneurs in the consumer goods industries to *only* increase operating expenditure when demand for their product rises. Increasing output by increasing capital utilization can only go so far. There are capacity constraints in the consumer goods industries which can only be lifted by purchasing additional machinery. Under the circumstances that Hayek initially stipulated—an "elastic" availability of credit and increasing consumer spending—there should be ample room to *also* increase capital expenditure and install more capacity. Output would be increased by a combination of operating expenditure *and* capital expenditure, contrary to Hayek's claim that there is a tendency to shift to operating expenditure only (Haberler, 1943, p. 490).

This brings us to the one point on which Hayek is seen as having admitted defeat (Klausinger, 2012, pp. 21–22). For in "The Ricardo Effect," Hayek retreated from his assumption

that replacement machines which are to be built will be "less automatic" than the machines they will replace. These two concepts are intertwined in the theory and debate on the Ricardo Effect. Of course, they may have something to do with each other if increased capital utilization of the consumer goods industries is made possible by shifting labor away from the machine producing industries, leaving the latter with less manpower to build more automatic machines. This was precisely Hayek's thesis.

of an elastic supply of credit during the upswing, towards the assumption that “every prospective borrower will have to face an upward sloping supply curve of credit” ([1942a] 2012, p. 270). Hayek argues that the funds in the hands of entrepreneurs are limited and that therefore operating expenditure will at some point in the upswing be increasingly preferred above capital expenditure. This change of assumption implies that a decline of capital expenditure by the consumer goods industries—if that indeed happens during the upswing—occurs mainly because the supply of credit is drying up, rather than that the rate of profit on investment in fixed capital is declining vis-à-vis investment in working capital⁴ (Hayek, [1939] 2012, pp. 215–217; Kaldor [1942] 2012, p. 302). Professor Klausinger has interestingly commented that “in the end the Ricardo effect was salvaged by giving up most of what had distinguished it from alternative explanations of the upper turning point” (ibid., p. 22; cf. Blaug, 1997, p. 526). Indeed, because Hayek now made the increasingly limited availability of credit the “dominating factor” in bringing about the decline of investment, the superior profitability of investing in more labor-intensive methods of production no longer plays that role of the “dominating factor” that Hayek initially had assumed for it ([1939] 2012, p. 212).

Hayek himself did not admit defeat ([1942b] 2012). His stubborn resistance comes from relying on another argument he brings to the table:⁵ Investment must also be constrained because of the scarcity of real capital. An individual firm may be so lucky that the machine it wants to acquire stands “waiting in the shops,” but what “might be true for any one firm [...] will not be true when

⁴ Note that Hayek used the phrase “investment in working capital” in the sense of what nowadays would be called *operating expenditure*. It does not necessarily mean “investment in *net* working capital” (i.e. the cash buffer between receipts and expenditures) although increasing operating expenditure may very well imply that an increase in net working capital is needed since expenses on wages and raw materials would increase.

⁵ Hayek, in “The Ricardo Effect” ([1942a] 2012), interweaves the “scarcity of money capital” argument (based on changing the assumption towards an upwards sloping supply curve of credit” with the “scarcity of real capital” argument. As does Kaldor ([1942] 2012), I treat them separately.

all firms are simultaneously in the same position" (ibid., p. 278).⁶ Hayek uses the limited availability of real capital as evidence that "additional equipment and still more the output produced by it will be available only after considerable delay. And in the interval till this output is available profits which might have been made by quicker methods will be lost and ought to be counted as part of the cost of the production for the most distant future" (ibid.). Besides arguing that realizing profits in the near future will take precedence, Hayek also argues that the decline of investment comes about for two other reasons. One is that the price of machinery would go up because of an increasing scarcity of labor in the machine producing industries, as labor is being reallocated to the consumer goods industries. The other is that, in so far as new machines are ordered, these will be the cheaper (less labor-saving) types of machines which can be installed more quickly (ibid., p. 281).

Kaldor responded that a rise in prices of machines has nothing to do with what Hayek is trying to prove. A rise in the price of machinery will not lead to a decline in investment from the consumer goods industries:

[Hayek] confuses influences coming from the side of demand with influences coming from the side of supply. If the price of machinery rises, the demand for machines will be less than if it did not rise. But the price of machinery has only risen, on his assumptions, *because* demand has risen; how does this explain then the emergence of unemployment [in the machine producing industries]? His business is to prove that demand will fall; not that a rise in demand will be checked by a rise in price. ([1942] 2012, p. 307, footnote omitted; cf. Wilson, 1940, p. 176)

There is one part of Hayek's main thesis that Kaldor cannot put aside completely. This is that entrepreneurs in the consumer goods industries will prefer cheaper but less labor-saving machinery (which can be installed more quickly) over more labor-saving equipment (which will take longer to put in place). But to Kaldor even this does not prove much:

It is only if the entrepreneur expects higher prices for his products in the near future than in the more distant future that it might become more

⁶ This argument was probably directed against what Kaldor called Kaldor's "representative firm subterfuge" (Desai, 1991, p. 67; cf. Kaldor, 1939, p. 44).

profitable to install the machine with the shorter construction period, even though the rate of interest is the same [...] assuming that the latter is the case, what does it prove? [...] Professor Hayek has taken on himself to prove that this will cause a fall in demand for capital goods, and thus unemployment in the capital goods trades; and to the latter contention the argument contributes nothing at all." ([1942] 2012, p. 308)⁷

2.3 Hayek's Visualizing Problem

One problem that Hayek himself identified with his theory was that he admitted to "find it difficult to visualise precisely how [the Ricardo effect] will be brought about" (Hayek [1942a] 2012, p. 280). That Hayek did not really have a precise visualization how the Ricardo Effect would occur may also be evident from his description of that effect:

the [Ricardo] effect [...] will be twofold. On the one hand it will cause a tendency to use more labour with existing machinery, by working over-time and double shifts, by using outworn and obsolete machinery, etc. On the other hand, in so far as new machinery is being installed, either by way of replacement or in order to increase capacity, this, so long as real wages remain low compared with the marginal productivity of labour, will be of a less expensive, less labour-saving, and less durable type." ([1939] 2012, p. 219)

In fact we find here three different effects. The first is increased capital utilization ("over-time and double shifts") The second is an asset replacement delay ("using outworn and obsolete machinery"). Only the third is the narrow interpretation of the Ricardo Effect as factor substitution (changing to "less labour-saving" machinery). There is not one concrete manifestation of the Ricardo Effect. The common aspect is simply that they all help produce output in the near future at the expense of output in the distant future. A Ricardo

⁷ Hayek did not use the phrase "construction period" in his theory of the Ricardo Effect. Kaldor's use of this term, which was used by a number of authors in the 1930's capital debates, is a good indication that this point has more to do with the capital-theoretic questions that form part of the background of the debate. The idea behind both Hayek's and Kaldor's reasoning is the law of roundabout production, i.e. that longer construction periods (given "wisely chosen" methods) result in more labor-saving machinery (Hayek, [1941] 2009, p. 77).

Effect could thus be defined more broadly than just a decline of investment on the part of the consumer goods industries. In Hayek's intertemporal framework a Ricardo Effect can simply mean *any* shift of resources, a "redistribution of production factors in time as a consequence of a change in the rate of profit" (Birner, 1999, p. 805). This may also suggest that the thesis of the decline of investment on part of the consumer goods industries might only have been an initial rough sketch to visualize what is going on during the latter half of the upswing. In other words, that it is an attempt to concretely visualize a more abstract thesis behind it, namely that towards the end of the upswing resources are shifted towards near future output.

What might Hayek's visualizing problem be? A clue lies in section 7 of *Profits, Interest and Investment* ([1939] 2012, pp. 223–226) in which Hayek raises problems with his own visualizing tool, the stages-of-production concept. It involves the capital-theoretic question of combining two different points of view (cf. Birner, 1999, p. 805). On the one hand there is the viewpoint of the Austrian theory of capital, which is intertemporal. It makes a "longitudinal section" of the economy. It considers what happens over a stretch of time and looks upon production as going on in stages through time. On the other hand there is the view of an economy as a dichotomy of a consumer goods industry and a machine producing industry. It is a viewpoint often encountered in the theory of the Ricardo Effect, and it is usually considered a "cross section" viewpoint of production. It considers what happens at a moment or a single interval of time (Wicksell, 1934, pp. 236–237; cf. Garrison, 2001, p. 47; cf. White, 2007, p. xxiv).

Hayek makes use of both the cross-sectional and the intertemporal viewpoints, although as an Austrian capital theoretician, it seems to me, he is principally thinking in intertemporal terms. Therefore Hayek has to translate the meaning of the "lengthening and shortening of roundabout production"—which is going on in multiple "stages"—into the cross-sectional scheme of a division of just two "industries." When we lay the intertemporal stages-of-production concept over the cross-sectional concept, we can say that the machine producing industries is the preceding stage of the consumer goods industries, while the consumer

goods industries is the following stage. The words “stage” and “industry” seem to have roughly the same meaning.

There is a complication, however, in laying the stages-of-production concept over the cross-sectional scheme of two industries. The consumer goods industry is the last stage; the machine producing industries comprise the one before that. But which industry is the preceding stage of the machine producing industries? The straight answer is that the machine producing industries are their own suppliers of capital goods—the industries are their own preceding stage. This phenomenon was called the “circularity” of the “partial self-reproduction of real capital” in the 1930’s capital debates (Kaldor, 1937; Eucken, 1940). In this lies Hayek’s visualization problem. The complication is the question how to fit such a “circularity” into the linear stages-of-production concept (Hayek, [1935] 2012, pp. 224–225).

Hayek recognizes this difficulty, but he also avoided exploring in which way he could come to a model that would include such circularities. The only clue he left was a reference to a study by Burchardt (1931) which commenced the German 1930’s capital debates ([1939] 2012, p. 225). This issue of “circularities” was also not drawn into discussion in the debates on Hayek’s theory of the Ricardo Effect in the early 1940’s (Wilson, 1940; Hayek, [1942a] 2012; Kaldor [1942] 2012). Nor has a discussion of its possible significance for “Ricardo Effects” appeared in the secondary literature since then (Lachmann, 1940; Lutz and Lutz, 1951; Gilbert, 1955; O’Driscoll, 1977; Haberler, 1986; Moss and Vaughn, [1986] 2010; Steele, 1988; Hagemann and Trautwein, 1998; Birner, 1999; Gehrke, 2003; Klausinger, 2012).

3. POINTS OF DEVELOPMENT OF HAYEK’S THEORY OF THE RICARDO EFFECT

In what follows is a list of points on which my development of the theory of the Ricardo Effect originates in Hayek’s theory of the Ricardo Effect. In my development I will deviate at various points from the importance that Hayek gives to certain aspects of his theory, such as his concrete thesis and his conclusions. I believe I can still call my theory a “development of the theory of the Ricardo Effect,” since almost all of these deviations are the result

of re-evaluating or developing the ideas and concepts of Hayek's original theory of the Ricardo Effect.

(1) I follow Hayek in believing that "a rate of profit rather than a rate of interest is the dominating factor in this connection" (ibid., p. 212). It means, I think, that the lead role in bringing about the crisis, at least in the second half of the upswing, lies not with capitalists that have malinvested their expenditure on fixed capital because of misguidance by the rate of interest (Hayek [1935], 2008, p. 272). On the contrary, it has to do with capitalists that unmisguidedly reap profits by decreasing their capital expenditure and increasing their operating expenditure (cf. Kaldor, 1939, p. 64; [1942] 2012, pp. 286–290; cf. Huerta de Soto, 2006, pp. 368–370).⁸

(2) I will stick to Hayek's initial assumption of a continuing credit expansion throughout the upswing, which was more or less tied to the rate of profit as the "dominating factor." I believe Hayek's 'retreat,' by changing his assumptions on the supply of credit during the upswing in "The Ricardo Effect" ([1942a] 2012), and so giving up most of what was original in his approach in *Profits, Interest and Investment* ([1939] 2012), has everything to do with his sticking to his concrete thesis that during the upswing the capitalists of the consumer goods industries decrease their capital expenditure.

(3) In terms of understanding the structure of production through theoretical concepts, section 7 of *Profits, Interest and Investment* ([1939] 2008, pp. 223–226) offers some very interesting suggestions for developing the "stages of production" concept from *Prices and Production* ([1935] 2008, pp. 223–252). Hayek left here much room for development, especially in incorporating the role of fixed capital and "circularities" into the concept of the stages of production.

(4) Comparing Hayek's theory of the Ricardo effect ([1939] 2012; [1942a] 2012), with Mises's chapter on the business cycle in *Human*

⁸ This thematic difference perhaps accounts for the fact that Hayek's theory of the Ricardo Effect is hardly integrated into modern versions of the Austrian Business Cycle Theory (ABCT). Modern versions of ABCT often build on Hayek's *Prices and Production* (e.g. Garrison, 2001, p. 11) and are largely occupied by explaining the malinvestment of capital expenditure during the business cycle through analyzing the circumstances of committing capital expenditure (ibid., p. 81).

Action ([1949] 1998, pp. 535–583), there is an interesting difference between these two originators of the Austrian business cycle theory. To Mises, the “very well known fact” is that the machine producing industries are “overloaded with orders” when the business cycle is approaching the upper turning point (*ibid.*, p. 583). This ‘stylized fact’ suggests that only in the downswing the machine producing industries will start to experience idle capacity. Hayek’s theory of the Ricardo Effect, however, posits the thesis that somewhere half-way the upswing of the business cycle, the consumer goods industries increasingly do *not* replace their worn-out machines and do *not* invest in modernizing their machinery ([1939] 2012, p. 219; [1942a] 2012, pp. 267–268). This suggests that the ‘stylized fact’ should be that there is already a fair amount of idle capacity in the machine producing industries when the business cycle approaches the upper turning point.

The interesting difference between Mises and Hayek is thus a difference in what is (according to Mises) and what theoretically ought to be (according to Hayek) the ‘stylized fact’ concerning the level of idleness in the machine producing industries as the business cycle approaches the upper turning point. I believe Mises is right about his stylized fact, which partly accounts for the main deviations between Hayek’s theory of the Ricardo Effect and my development of it. However, the connection with Hayek’s original theory is that I believe that Hayek was right in principle about the occurrence of a Ricardo Effect.

(5) Hayek relies in his theory of the Ricardo Effect on the wage rate as the major element in the profit mechanism, for capitalists will compare the “profit earned on the turnover of any amount of labor” invested for different periods ([1939] 2012, p. 215). The role of the wage rate seems therefore crucial in the theory of the Ricardo Effect, as Hayek clearly says that the “substance [of the Ricardo Effect] is contained in the familiar Ricardian proposition that a rise in wages will encourage capitalists to substitute machinery for labor and vice versa” (*ibid.*). However, Hayek subsequently also argued that “it is through this [Ricardo] effect that the scarcity of real capital will make itself ultimately felt” ([1942a] 2012, p. 259). In my development of the theory of the Ricardo Effect, I will deviate from Hayek’s original theory by taking the profit earned on the turnover of versatile fixed capital

as the major element determining “the rate of profit.” This is also consistent with point (3) above.

(6) In his theory of the Ricardo Effect, Hayek argues that a shift from capital expenditure towards operating expenditure takes place ([1939] 2012, p. 219; [1942a] 2012, p. 262; [1946] 2009, p. 149). Hayek’s suggestion that this increase in operating expenditure would occur “at a point somewhere half-way through a cyclical upswing” (Hayek [1939] 2012, p. 217) seems almost identical to Keynes’s finding that “the characteristic secondary phase of a credit cycle” was “due to the growth of investment in working capital” (Keynes, 1930, p. 252). Much earlier Lord Overstone, a leading member of the Currency School, had pointed towards widespread “overtrading” ([1857] 1972, p. 31)—pushing operating expenditure to or beyond the sustainable margin—in the excited last phase before the upper turning point. Now, whether increasing operating expenditure is the result of a shift from capital expenditure or not, it remains a ‘stylized fact’ of cyclical upswings that workers are employed in “over-time and double shifts.” Hayek’s theory of the Ricardo Effect can be seen as an attempt to explore this aspect of the business cycle, and its possible link to overconsumption (cf. Salerno, 2012). Although I will attempt to demonstrate a slightly different thesis than Hayek’s, the task remains to explain this increase in operating expenditure.

(7) In discussing the role of rising costs, and especially rising prices of raw materials, during the upswing, Hayek expands the model of a “crude dichotomy of industry into consumers’ goods industries and capital goods industries” into a trichotomy that also includes a raw materials industry ([1939] 2012, pp. 229–230). With Hayek this trichotomy remains a short verbal sketch, which I will attempt to develop.

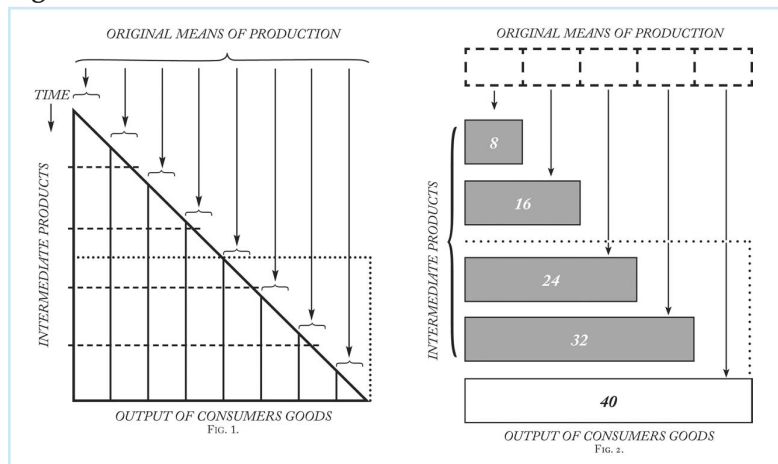
4. THE STRUCTURE OF PRODUCTION

4.1 The Difficulties of the Stages-of-Production Model

In *Prices and Production* ([1935] 2008) Hayek introduced his famous triangles of the structure of production, what he called the “stages of production.” What is important to mention about his triangles in that book, is that the first triangle he provides is a *longitudinal* or *intertemporal* triangle, reproduced as Figure 1 below (ibid., p. 228).

The second to sixth figures of triangles (such as Figure 2 below) are *cross-sections* of the first figure (ibid., pp. 232–247).

Figures 1 and 2



The difference between them is that Hayek's cross-sectional triangles deal with the *current* distribution of inputs (and spending) among stages that are performed simultaneously "in a given period" ([1935] 2008, p. 232). A cross-section can be likened to a snapshot of a situation at a moment in time. The intertemporal understanding of the economic process follows from imagining the sequence of such cross-sections, much like a moving picture is actually a sequence of snapshots. Hayek moves from one cross-section to another in order to portray the changes in the structure of production due to either increased (voluntary) savings or (fiduciary) credit expansion (ibid., pp. 232–247). However, only the first figure is really intertemporal in itself (or "longitudinal," as Wicksell would say). It not only represents *current* output of consumer goods and intermediate goods on the one hand, it also serves as a picture of *future* output due to the present allocation of resources. Hayek's particular intertemporal triangle deals with the output due to the average length of production in a "stationary society" (ibid., p. 229). In a stationary society *future output* of consumer goods and intermediate goods is as high as the *current output* of those goods. The intertemporal function of this triangle may seem somewhat purposeless therefore, because there are no intertemporal differences of output in a stationary society. The point

is that if such a stationary society would be transformed into another stationary society with a longer average period of production, then after a period of transition in which the output of consumer goods is lowered, the current production of both intermediate goods and consumer goods will have increased. During the “traverse” between two stationary societies, some stages are partly abandoned, in order to perform stages not previously engaged in. After the traverse, the intertemporal triangle has become wider and longer.

As mentioned before, in *Profits, Interest and Investment* ([1939] 2012) Hayek reflects on the question of how the demand for capital goods plays out in the “structure of capitalistic production.” He argues that “a crude dichotomy of industry into consumers’ goods industries and capital goods industries is wholly insufficient to reproduce the essential features of the complicated interdependency between the various industries in real life” (ibid., p. 224). Certainly, this dismissal of the “crude dichotomy” is rather incompatible with the fact that he uses such a dichotomy in various parts of his theory of the Ricardo Effect. A telling example is Hayek employing a verbal model of “integrated firms” which consist of two departments; one department that produces commodities, another department that produces machines ([1942a] 2012, pp. 279–280).⁹ Hayek also extensively uses the closely related distinction between “expenditure on wages (or investment in ‘circulating capital’) and expenditure on machinery (investment in ‘fixed capital’)” (ibid., p. 262).

Besides commenting on the insufficiency of the “crude dichotomy,” Hayek also addresses the insufficiencies of his own stages-of-production model, which consists of more steps in the production process than just two.¹⁰ To Hayek, the stages-of-production model “is not quite adequate for the purpose” either ([1939] 2012, p. 224). He points out that it “gives the impression of a simple linearity of the dependency of the various stages of production which does not apply in a world where durable goods are the most important form

⁹ The (Marxian) dichotomy of consumers goods industries and machine producing industries was called the *Abteilungsschemen* in German (Eucken, 1940, p. 118), which literally stands for “departmental scheme” (Nurkse, 1935).

¹⁰ Hayek does not make explicit whether his doubts concern the longitudinal or the cross-sectional stages-of-production concept. I believe it refers to the cross-sectional stages-of-production concept.

of capital" (ibid.). This is because, as he admits, it was based on the "assumption that all capital used was of the nature of circulating capital" (ibid., p. 224). Hayek then speculates on a modification of his stages-of-production concept, by designating some stages as responsible for producing fixed capital:

If we designate the production of consumers' goods as stage I we can then classify the various industries which directly supply the consumers' goods industries with capital goods of various kinds as stages II, III, IV, etc., according to the more or less "capitalistic" character of the equipment which they supply. Stage II would supply the consumers' goods industries with the least capitalistic type of requirements, such as the raw materials and their simplest tools. Stage III would supply them with equipment of little durability and machinery of the least automatic type. Stage IV would supply a somewhat more capitalistic (more durable or more labour-saving) type of machinery, and so on to stage V, VI, etc., in ascending order. (ibid., p. 224)

Through this modification, a machine from stage IV could be delivered immediately to the consumer goods producers at stage I. That machine does not have to pass a number of stages in between. It is in the nature of circulating capital that it often does pass a number of stages when it is processed from raw materials into consumer goods. In this respect, Hayek certainly revises his expository device of *Prices and Production* ([1935] 2008).

But Hayek still feels that such an adaption of the stages-of-production concept "gives an undue impression of linearity of these relationships while in fact they may in many respects be rather circular in character" (ibid., pp. 224–225). What Hayek means must be something like this: The more labor-saving equipment provided by stage IV would be used to help produce the "simplest tools" that will be put out by stage II, while at the same time the "simplest tools" provided by stage II could also help to produce the "more labor-saving equipment" at stage IV. So for fixed capital, it is not only the case that a number of stages could be passed over when it travels from a higher to a lower stage. Its services may also be "put back" to a higher stage (Eucken, 1937, p. 541 *et passim*). This phenomenon of "circularities"¹¹ in the structure of production

¹¹ The phenomenon of "circularities" has also been described as "whirlpools" (Dorfman, Samuelson, and Solow, [1958] 1986, p. 205) and recently as "looping"

played an important role in the 1930s capital debates as it formed a challenging aspect to the 'Austrian' stages-of-production concept (Kaldor, 1937). Hayek alludes to this phenomenon by referring in a footnote to a study by Burchardt that started the 1930s capital debates in Germany (ibid., 225). Hayek even notes Burchardt as having given "the most fruitful of all the recent criticisms of the 'Austrian' theory of capital" (ibid.).

This is the point in the original theory of the Ricardo Effect where Hayek practically invites it to be developed. Hayek offers a few pages of doubts and ideas about the stages-of-production model, but it does not lead up to a systematically elaborated improvement over *Prices and Production* ([1935] 2008). In what follows I will treat the relation of cross-sections to intertemporal output first, before addressing the "circular" relationships in the cross-section itself.

4.2 Sequences of Cross-Sections to Picture Intertemporal Changes

The longitudinal and cross-sectional aspects of the Hayekian triangle may easily get confused because the first figure on the one hand, and second to sixth figures on the other hand, are all triangular. In fact, Professor Garrison argues that "the Hayekian triangle has a double interpretation" (2001, p. 47). This double interpretation has resulted from fusing the two different kinds of triangles into one. For the further discussion, I propose to disentangle these purposes by keeping the cross-sectional and longitudinal aspects apart by not fusing them into a single stages-of-production concept. As far as the question of understanding the relationship between the intertemporal aspects of production and the interdependencies of industries, I find it useful to employ a cross-sectional model (not necessarily a triangular model) that pictures the *current* distribution of input, and then think of the future consequences of that current distribution in order to draw a subsequent cross-section.

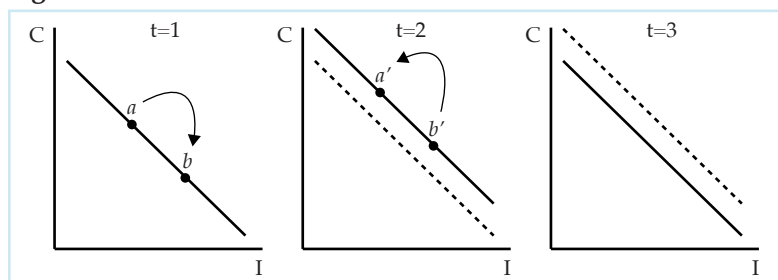
As a simple cross-section of an economy, we can take Professor Garrison's *production possibilities frontier* or "PPF." The PPF depicts

(Cachanosky and Lewin, 2016, p. 17). While Dorfman et al. and Cachanosky and Lewin seem to use these phenomena *against* the determinability of a structure of production, Lowe (1976, p. 34) uses it as evidence *for* such a determinability.

the current distribution between consumption-spending C and investment-spending I , as depicted in the three PPFs in Figure 3. Therefore, it could be said that “a crude dichotomy of industry into consumers’ goods industries and capital goods industries” is implied in Professor Garrison’s PPF, simply because it crudely divides the economies’ output into consumer goods and capital goods (*ibid.*, p. 46). The underlying thought of Professor Garrison’s PPF is intertemporal, because “the economy grows to the extent that it uses its resources to the production of capital goods rather than the production of consumer goods” (*ibid.*, p. 41). However, the PPF does not depict future output or future output capacity. But if we imagine a sequence of PPFs we could say that any PPF at time t is the result of the distribution between consumption-spending (C) and investment-spending (I) along the PPF at time $t-1$.

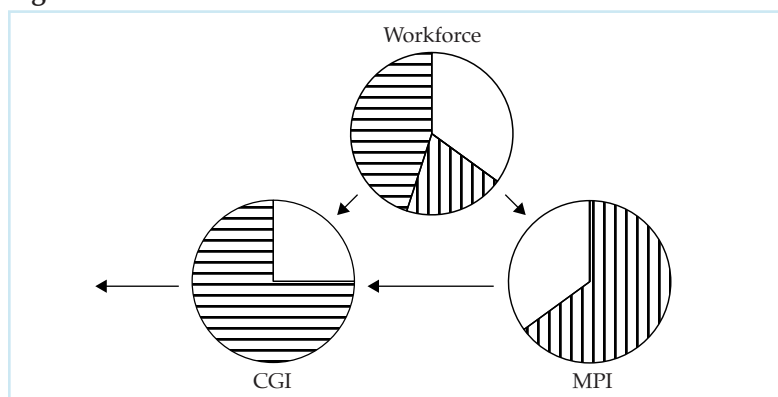
Such a sequence is actually depicted in Figure 3: Suppose a movement along the PPF towards more investment (a to b) takes place at $t=1$. This would imply that the economy has more resources at the next cross-section at $t=2$. In other words, it will have more resources at $t=2$ as the result of more resources being devoted to producing capital goods rather than consumer goods at $t=1$. The PPF shifts outwards from $t=1$ to $t=2$ (the dotted line at $t=2$ representing the PPF at $t=1$). Then at $t=2$ a new allocation would have to be made among consumption-spending and investment-spending. Suppose that this choice involves an allocation of such a small amount of investment-spending that the capital stock of the economy cannot be maintained intact (from b' to a'). This will mean that the PPF will shift inwards from $t=2$ to $t=3$.

Figure 3



In the above-pictured sequence of PPFs, all current allocations between consumption-spending and investment-spending involve a near-future/distant-future trade-off. But this PPF does not discriminate between the resources that are generally versatile, partially versatile, or completely specific. In reality, of course, some resources are capable of being “put back” to higher stages of production, but some are not. In order to make the cross-sectional model better adaptable to handling this problem, we can first convert Professor Garrison’s PPF into three related pie-charts (Figure 4 below). On top we have a pie—the *workforce*—which represent the allocation of a generally versatile resource, labor. Part of this pie will be allocated to the consumer goods industries (*CGI*, on the left below), part of it will be allocated to the machine producing industries (*MPI*, on the right below), and another part will represent the unemployed workforce.¹² Both pie-charts beneath the workforce-chart represent the level of capital utilization in each industry. The amount of workers allocated to an industry is correlated to the level of capital utilization, which is represented by the same pattern to illustrate each piece of the pie. For example, in the “workforce” pie-chart on top, the horizontal lines represent the number of workers allocated to the consumer goods industries, while in the *CGI* pie-chart the horizontal lines represent its level of capital utilization. The arrows pointing to the left represent an outflow of goods. Specifically, the output of consumer goods (the arrow left of the *CGI*) and the output of machines destined for the consumer goods industries (the arrow between the *CGI* and the *MPI* pie-charts). The arrows pointing downwards simply indicate that labor has to be allocated to each of the two industries.

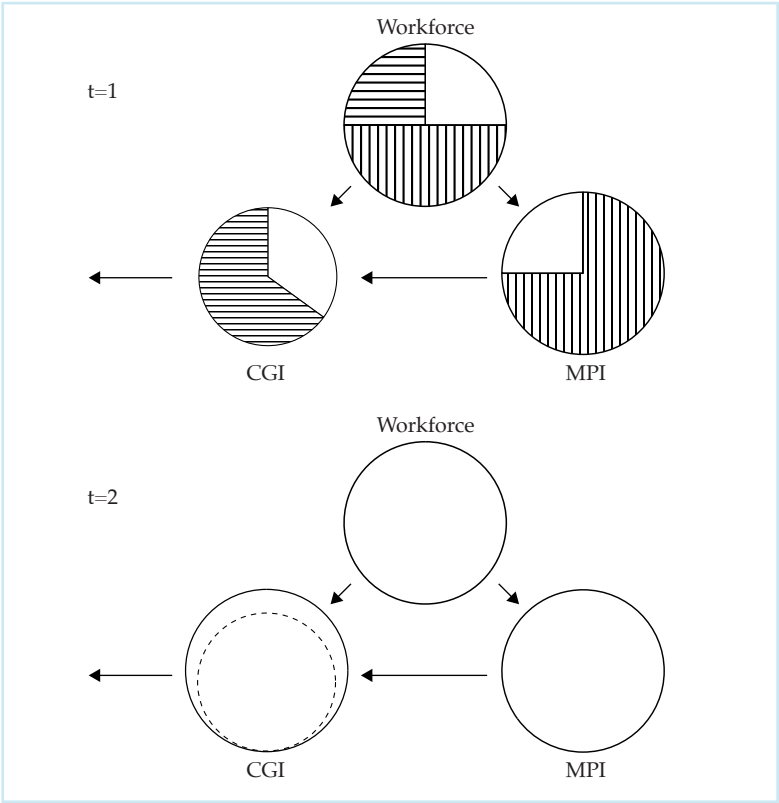
¹² The measure of unemployment can here be likened to the measure in which an economy operates within the bounds of the PPF.

Figure 4

Just as Hayek presented a series of subsequent triangles in *Prices and Production*, we could also present a sequence of these pie-chart models in order to follow the consequences to productive capacity by changing the current allocation of labor. An example is provided in figure 5 below. In this figure we will now also assume that the size of the consumer goods industries' pie-chart will represent its productive capacity. In other words, a larger pie means a higher productive capacity, and vice versa. This productive capacity must be maintained by the output of the workers allocated to the machine producing industries. In figure 5 it may be, for example, that 40 percent of the workforce must be allocated to the machine producing industries at $t=1$ in order to provide enough replacement machinery (over the next interval) so that the capacity of the consumer goods industries will be maintained intact at $t=2$. Now suppose that at $t=1$ some labor is re-allocated from the consumer goods industries towards the machine producing industries, so that 50 percent of the workforce will make machines. The cost of this re-allocation is that in the period between $t=1$ and $t=2$ less consumer goods will be made had the re-allocation not been made. The benefit will be that at $t=2$ more machines will have been delivered to the consumer goods industries than was necessary to maintain its capacity. Its capacity must have grown. In the next cross-section at $t=2$ this is represented by a larger circle for the consumer goods industries. The inner dotted circle represents the former capacity at $t=1$, in order to emphasize that capacity has changed. The way in which labor is allocated

among the pies of *CGI* and *MPI* at $t=2$ will, in turn, determine output of consumers goods during the next interval, as well as the new capacity of the *CGI* at $t=3$, etcetera. This allocation at $t=2$ is intentionally left blank in order to emphasize that the allocation at $t=1$ determines the capacity of the consumer goods industries available at $t=2$, but the allocation at $t=1$ certainly does not determine the way the workforce will be allocated in going from $t=2$ towards $t=3$.

Figure 5



4.3 Circularities in the Cross-Section

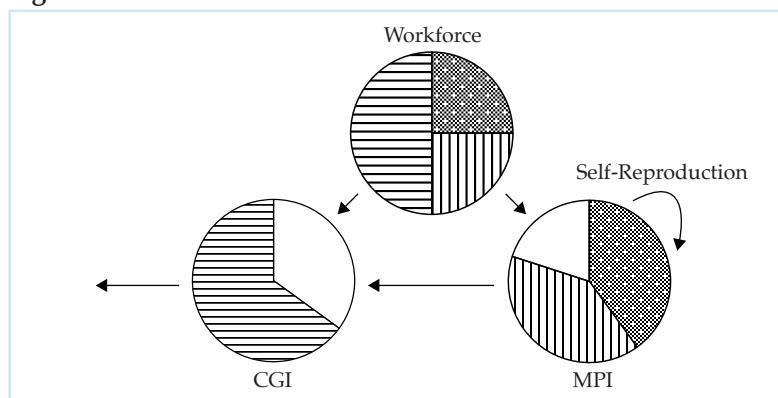
Let us now follow up on Hayek's reference to the "the most fruitful of all the recent criticisms of the 'Austrian' theory of capital" by Burchardt (1931).¹³ Burchardt's complaint against the Austrian theory of capital was that in its stages-of-production concept there is the assumption that in all contemporary production an initial stage of production exists that produces intermediate products without the help of intermediate products (*ibid.*, p. 540). Applied to Hayek's stages-of-production triangle, we can in fact see that in its highest stage only original means of production are applied, while in all other stages below that original means of production co-operate with intermediate means of production. In actual economies, Burchardt argued, there are no stages of production going on that work without the aid of intermediate products or "real capital." Burchardt, who preferred to theorize in terms of the "crude dichotomy" of consumer goods industries and machine producing industries, offers a simple example to support his claim. He notices that the machine producing industries, "next to machines for the consumers' goods industries also build the machines, that are applied for reproduction of themselves" (*ibid.*, p. 546). If the machine producing industries is looked upon as a stage, it would partly be its own higher stage of production. This was also called the "circularity" of the "partial self-reproduction of capital goods" by Burchardt (*ibid.*, p. 547).

Let us now incorporate into our pie-chart scheme this "circularity" of the "partial-self reproduction of real capital." We can picture this by drawing a circular arrow—representing "self-reproduction"—back to the machine producing industries. Also, we can now divide the pie-chart of the machine producing industries into three pieces: (1) Production for the consumer goods industries, illustrated by vertical lines; (2) the "self-reproduction," illustrated by the "+" marks; and (3) idle capacity, in white. This is also reflected in the allocation of the "workforce." Within the

¹³ In Hayek's original publication of *Profits, Interest and Investment*, he referred to Burchardt (1932), but as Professor Klausinger points out in his editing remark in Hayek ([1939] 2012, p. 225), there was also a first part published in 1931. As Burchardt (1931) focuses on the capital theory of Böhm-Bawerk and Burchardt (1932) on that of Marx, the first part is likely the one that Hayek meant (Hayek, [1939] 2012, p. 225).

machine producing industries, output capacity must be divided between providing the consumers goods industries with machines, and providing itself with replacement-machinery and additional machinery. In doing so we are also letting go of the assumption of a given productive capacity for the machine producing industries.

Figure 6



Again we could imagine a sequence of pie-chart models, a moving picture, that shows the intertemporal consequences of the current distribution of resources. Suppose, for example, that at $t=1$ more capacity of the machine producing industries is allocated towards “self-reproduction,” at the expense of production for the consumer goods industries. This will have the consequence that at $t=2$ the consumer goods industries will have lost some capacity due to worn-out machines for which the machine producing industries have not provided a replacement. However, the capacity of the machine producing industries must have grown from $t=1$ to $t=2$. This will give rise for new possibilities for the period between $t=2$ and $t=3$, because the additional capacity in the machine producing industries can now help rebuild the lost capacity of the consumers goods industries to a level higher than before (cf. Lowe, 1976, p. 110).¹⁴

¹⁴ Apart from adding the “circularity” I have also assumed full employment of the workforce. This is done to illustrate one of Hayek’s points regarding capital utilization: Idle capacity can exist in both the consumer goods industries and the machine producing industries despite all workers being fully employed. Idle capacity is not necessarily a sign that an economy operates within its production

In order to facilitate the understanding of the time-structure of production vis-à-vis the linear-and-circular relationships of industries, I think it is advisable to reserve the word “industry” to the cross-sectional model, and to reserve the word “stage” (and “stage of production”) to the intertemporal considerations. The word “industry” refers then not to the type of output, but to the type of current fixed capital input. The consumer goods industries are the industry with the specific equipment, the machine producing industries are the industry with the versatile equipment. The word “stage” refers then to the time-distance of the contribution of the output of an industry for final consumption (cf. Eucken, 1940). The consumer goods industries always perform a last stage, it is an industry that processes raw materials into consumer goods. However, the machine producing industries can perform any number of stages: A short time-distance towards contributing to consumption would be to use the currently available capacity of the machine producing industries towards building machines for the consumer goods industry directly. A more roundabout approach would be to first perform the stage to build additional, but similar, equipment for the machine producing industries itself. With more capacity in hand, it could then perform a second stage of building more machines for the consumer goods industries than with the aforementioned “direct” method. A still more roundabout approach would be to first perform two or more stages of developing more elaborate machine-tools than are now in existence. This will undoubtedly take a longer time than to manufacture equipment similar to a type already in existence. Again a next stage would be to manufacture machines for the consumer goods industries, which could be of a more labor-saving type.

5. THE RICARDO EFFECT IN THE MACHINE PRODUCING INDUSTRIES

The key difference between the consumer goods industries and the machine producing industries is that the former can utilize its current capacity to fulfill the orders of its customers *and* let

possibilities frontier. A lot of factories will be left idle during evenings, nights and weekends, and this does not necessarily mean an inefficiency in the economy (Hayek, [1936] 1984, p. 175 *et passim*).

additional capacity be installed by an outside industry. There need be no choice between operating expenditure and capital expenditure when credit is elastic. Operating expenditure can be increased until full capacity is reached; capital expenditure can be increased to get more capacity.¹⁵ Contrary to the consumer goods industries, the machine producing industries cannot outsource the task of building their own capacity to another industry. So even under elastic credit the machine producing industries do have to shift between operating expenditure (producing for the consumer goods industries) and capital expenditure (producing for itself). If the Ricardo Effect is a creature, the machine producing industries could be its natural habitat.

From the perspective of the consumer goods industries we can say that voluntary saving would mean a relative decline in consumer spending. The consumer goods industries would need to order more labor-saving machinery to be able to reduce their operating costs and so still make profits. With fiduciary credit expansion there would not be a similar reduction in consumer spending. It seems that it is likely that this encourages entrepreneurs in the consumer goods industries to enlarge the scope of their activities, to invest in more productive capacity. At the same time, they have less incentives for cost-saving equipment than in the case of voluntary savings.

When we turn to the point of view of those that build the machines, it is also likely that an increased demand from the consumer goods industries for machines, fueled by inflationary credit, makes the prices of machines rise relative to wages and materials. What will the machine producing firms do under such an “acceleration effect”? These firms must either (1) allocate capacity to provide the consumer goods industries, or (2) invest in their own output capacity by declining to fulfill orders from the consumer goods industries. The second option, investing, means machine producing firms buy their own output at higher shadow prices than they did before the credit expansion. They would do this if they expect that, with increased capacity in the next period,

¹⁵ Under elastic credit and increasing consumer spending, operating expenditure would only be increased until marginal operating revenue equals marginal operating costs, which may or may not be achieved before full capacity utilization.

demand will still be as high as to compensate the opportunity cost of not serving customers in the present period. The first option simply means not to invest, but to manufacture and sell more machines for the consumer goods industries and reap 'windfall profits.' This option means higher profits than before, because credit expansion has inflated the prices of machines.

When we are at the beginning of what is expected to be an upswing, machine producing entrepreneurs may perhaps decline orders so they can increase capacity somewhat later. But concerning the latter half of the upswing, the Hayekian answer would, with a little speculation, be not much different than what Hayek said about his own, roughly similar question in "The Ricardo Effect":

The answer, I think, is to be sought *firstly* in the fact that the provision for the near future will necessarily have the first attention of the entrepreneur, because if the profits which might be made in the near future are not obtained, they (and perhaps a certain amount of permanent business) will be lost to a competitor. ([1942a] 2012, p. 281)

Obviously it depends on the individual entrepreneur in question in how far he will not fulfill current demand in order to have a greater capacity to fulfill future demand. In any case, current demand is a more or less measurable thing for the entrepreneur, while future demand is partly guesswork. When profit potential on current business rises, each entrepreneur must have some point at which he will tap into that current profit potential at the expense of a possibly greater—but more uncertain—profit potential somewhat further in time. The argument here is that there *must be* such a point at which the entrepreneurs in the machine producing industries tap into current profit potential at the expense of enlarging the productive capacity of their own industries. To deny this would mean that there is never any provision for the present or the near future at all, all resources being devoted to a never fulfilled future demand. The thesis here is thus that a credit-accelerated 'derived demand for machines' emanating from the consumer goods industries will—sooner or later during the upswing—result in reaching that point at which resources in the machine producing industries are allocated towards near future output.

If this thesis is admitted as correct, it explains an important fact. Mises pointed to this fact in his chapter on the business cycle in

Human Action ([1949] 1998), actually while discussing the “acceleration principle.” Here Mises indicates that:

[i]t is a very well known fact that the more the boom progresses, the harder it becomes to buy machines and other equipment. The plants producing these things are overloaded with orders. Their customers must wait a long time until the machines ordered are delivered. This clearly shows that the producers’ goods industries are not so quick in the expansion of their own production facilities as the acceleration principle assumes. (ibid., p. 583).

The consumer goods industries can outsource the production of the machinery they need to the machine producing industries; they can emanate a ‘derived demand for machines’ to this other industry. However, this is not so for the machine producing industries. Its derived demand for machines emanates in a circle back to itself. Therefore, the acceleration effect goes, as an American phrase says, only “as far as it goes.” Where this ‘derived demand for machines’ can get no further, because it has reached the highest stage of production for fixed capital, so to speak, the sober realization comes that the machine producing industries cannot magically expand. An allocative choice must be made, and it will be made on a profitability calculation. The “producers’ goods industries” that Mises wrote about may simply find it profitable—sooner or later during the upswing—to be not so quick in the expansion of their own production facilities, but rather collect windfall profits on a credit induced ‘capex boom’ (cf. Brown, 1957, p. 424; cf. Floud, 1976, pp. 61–67). The fact that the machine producing industries are overloaded with orders—rather than rejecting these orders so that the machine producing industries can expand—seems ample proof that a Ricardo Effect is happening there as the boom progresses towards the upper turning point.

7. THE RICARDO EFFECT IN THE RAW MATERIALS INDUSTRY

The Ricardo Effect in the machine producing industries still does not provide a complete explanation of “the partial scarcity of capital,” and with that, of the upper turning point. But it can serve as a stepping stone towards a second thesis. This thesis is

that a Ricardo Effect in the raw material industries is the reason for an increasing 'scarcity of circulating capital' as the upswing progresses (Lachmann and Snapper, 1938; cf. Hayek [1939] 2012, pp. 229–230; cf. Mises, [1949] 1998, p. 561). This increasing scarcity of circulating capital may be the proximate cause of the upper turning point, because the rising operating costs due to the relatively rapid rise in raw materials prices must start to put some marginal producers out of business as the upswing progresses. In order to provide some support for this thesis we must now return to the scheme of the structure of production.

In *Profits, Interest and Investment* ([1939] 2012), while discussing the rising prices of raw materials during the upswing, Hayek sketches a 'verbal model' of a three-sector economy containing a consumer goods industry, a machine producing industry and a raw materials producing industry (cf. Lachmann, 1940). Apart from the consumer goods industries, Hayek tries to reconcile the stages-of-production concept with the existence of the capital goods industries by distinguishing the latter further into "industries [...] which specialise in the production of [...] durable equipment" (Hayek, [1939] 2012, p. 226) or "producers of machinery" (ibid., 229) on the one hand and "raw material industries" (ibid., p. 231) on the other. These three sectors have peculiar functional relations among each other: The principle of derived demand is fully applicable to the relation between the consumer goods industries and their suppliers of raw materials. The reason is that: "raw materials are required in practically fixed amounts per unit of output of any particular commodity" (ibid.). But this is not so between the consumer goods industries and the machine producing industries, Hayek points out: An increase in demand for consumer goods may or may not increase the demand for machines, because increases in demand can often be met by a higher degree of capital utilization ("over-time and double shifts"). So the level of demand for consumer goods and the level of 'derived demand for machines' cannot be as correlated as the level of demand for consumer goods and the 'derived demand for raw materials' must be.¹⁶

¹⁶ Hayek gives the *acceleration principle* therefore a "multiplier": Suppose a firm has ten machines that each help produce a thousand products a day per 10-hour shift. Suppose also that demand increases by a thousand products a day. This firm can

Building on Hayek's idea of a trichotomy, the pie-chart scheme of a dichotomy between a consumer goods industry and a machine producing industry can be ameliorated with the raw materials industries. For this we will move the machine producing industries to the top of the scheme to symbolize its "strategic position in any industrial system" because of its self-reproducing capabilities (Lowe, 1976, p. 30). Labor, the generally versatile factor in Hayekian capital theory, takes center stage. The raw materials industries will form a separate sector that supplies both the consumer goods industries and the machine producing industries (cf. Weitzman, 1971, p. 513).

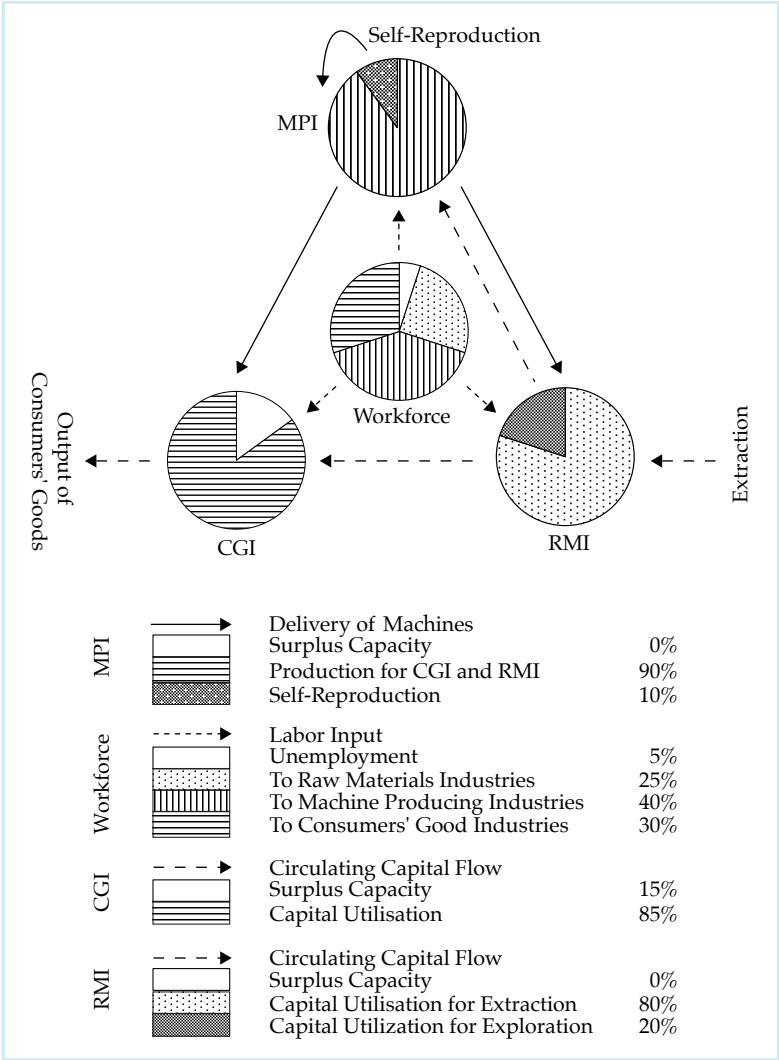
A 'circulating capital flow' leaves the raw materials industries and becomes 'goods-in-process' when it travels to the consumer goods industries. However, the circulating capital flow can also be diverted from that industry towards the machine producing industry. By this we visualize the idea that "iron may build machinery instead of park railings," that is, the possibility that raw materials can be "put back" to an earlier stage of production (Böhm-Bawerk, 1891, p. 112; Eucken, 1940).

Besides this choice in allocating its output, the raw materials industries must also make an allocative choice of its inputs (cf. Hayek, [1939] 2012, p. 230). The equipment it owns is to a certain extent versatile enough to either extract from currently operable natural resources¹⁷ (operating expenditure) or to explore for new natural resources and put them into operation (capital expenditure). The capacity of the raw materials industries is, as such, partly determined by the amount of machinery it receives from the machine producing industries and partly by the way it allocates its machinery. In other words, the raw materials industries cannot fully outsource the maintenance and extension of its productive capacity towards another industry. The raw material industries may therefore also be a habitat of the Ricardo Effect (*ibid.*).

either order another machine (a multiplier of one); it can order two machines if it expects demand to increase to 2000 products extra a day (a multiplier of 2); or it orders no machines at all if it increases its capital utilization by working each current machine an extra hour a day. Hayek's "multiplier" thus measures the correlation between increase in demand for consumer goods and the related demand for machines.

¹⁷ An oil field under the sea is a natural resource. The oil field becomes an *operable* natural resource if there is an oil platform on top of it that is able to extract the oil.

Figure 7



If we stick to the assumption of elastic credit, we must ask how and where additional credit will be spent once credit has subsidized the machine producing industries into full employment. As credit cannot procure any additional machines, output can only be increased by additional operating expenditure

(cf. Machlup, [1940] 2007, pp. 207–230; cf. O'Driscoll, 1977, p. 98). This implies not only higher employment, but also higher consumption of raw materials. Are the raw material industries, in such a boom, willing and able to increase their own productive capacity to such an extent that they can keep up with such a rising demand? If not, this would imply that an increasing scarcity of circulating capital is the phenomenon that could choke off the upswing. First, I think we could question the ability of the raw material industries to obtain enough equipment in time from the machine producing industries when the latter are already overloaded with orders. Second, the profit incentives to allocate those versatile resources which are capable of both exploration and exploitation will, in a way much similar to the profit incentives of the machine producing industries during the boom, shift in favor of providing for the near future at the expense of the more distant future.

In his original theory of the Ricardo Effect, Hayek sought an explanation for the fact that during booms raw materials rise faster in price than consumer goods ([1939] 2012, p. 229). If this is indeed a 'stylized fact,' it may explain that at some point during the upswing, marginal producers will be going out of business, as their operating revenue will no longer cover their operating expenditure (Mises, [1949] 1998, p. 561). It will also cause downsizing in the scale of operations with other producers.

Such an explanation of the proximate cause of the upper turning point may not seem incompatible with a purely monetary explanation of the crisis, as it could be argued that the rise of raw materials prices is due to a lack of credit for building additional productive capacity in the raw materials industries. In other words, one could argue that a credit rationing is behind the rise of raw materials prices.

I hope that the above development of the theory of the Ricardo Effect helps to explain why it is not a lack of credit, but rather the expansion of credit that helps to drive raw materials prices up. The credit contractions which are typical of upper turning points may very well be explained as a reaction of the banks to the revealing of malinvestments—i.e. to losses and bankruptcies—which themselves are caused by the rise in the prices of raw materials.

CONCLUSION

The Ricardo Effect has too often been interpreted too narrowly as a “substitution of capital by labor.” By taking a broader perspective, it has been possible to rebuild Hayek’s theory of the Ricardo Effect around a different thesis than Hayek’s own. Hayek could not win the debate over his original thesis, namely the thesis that, under elastic credit, a decline of investment by the consumer goods industries would occur during the upswing. The reason for this is simply that the consumer goods industries can outsource the production for additional productive capacity to an outside industry. This being the case, the consumer goods industries can increase both operating expenditure (increase capital utilization) and capital expenditure (order more capacity) at the same time. When I investigated the main capital-theoretic issue of the original theory of the Ricardo Effect, namely the “circularity” of the “partial self-reproduction of capital goods”—to which Hayek pointed—I have concluded that the machine producing industries cannot outsource their need for additional capacity to another industry. This realization is crucially important for the theory of the Ricardo Effect, as it helps identify the machine producing industries as the perfect habitat for the Ricardo Effect. I have also concluded that there is indeed enough reason to assume that elastic credit drives up the prices of machines in such a way that it can indeed give rise to a Ricardo Effect in the machine producing industries as a credit-induced upswing progresses. Following important clues that Hayek left, I have also been able to argue for a second thesis, by considering that after the Ricardo Effect occurs in the machine producing industries, and credit remains elastic, overall operating expenditure must increase. The second thesis was that as the boom progresses further, also a Ricardo Effect in the raw materials industries will occur, because also the raw materials industries cannot fully outsource the production of additional productive capacity to an outside industry.

REFERENCES

- Birner, Jack. 1999. “The Place of the Ricardo Effect in Hayek’s Economic Research Programme,” *Revue d’Économie Politique* 109, no. 6: 803–816.

- Blaug, Mark. 1997. *Economic Theory in Retrospect*. Cambridge: Cambridge University Press.
- Böhm-Bawerk, Eugen von. 1891. *The Positive Theory of Capital*. London: Macmillan.
- Brown, William H. 1957. "Innovation in the Machine Tool Industry," *Quarterly Journal of Economics* 71, no. 3: 406-425.
- Burchardt, Fritz. 1931. "Die Schemata des stationären Kreislaufs bei Böhm-Bawerk und Marx," *Weltwirtschaftliches Archiv* 34: 525-564.
- . 1932. "Die Schemata des stationären Kreislaufs bei Böhm-Bawerk und Marx," *Weltwirtschaftliches Archiv* 35: 116-176.
- Cachanosky, Nicolás, and Peter Lewin. 2016. "Financial Foundations of Austrian Business Cycle Theory." In Steven Horwitz, ed., *Studies in Austrian Macroeconomics*. Emerald Group Publishing, 15-44.
- Desai, Meghnad. 1991. "Kaldor between Hayek and Keynes, or: Did Nicky Kill Capital Theory?" In Edward J. Nell and Willi Semmler, eds., *Nicholas Kaldor and Mainstream Economics*. Basingstoke, U.K.: Palgrave Macmillan, 53-71.
- Dorfman, Robert, Paul Anthony Samuelson, and Robert M. Solow. 1958. *Linear Programming and Economic Analysis*. New York: Dover Publications, 1986.
- O'Driscoll, Gerald P. 1977. *Economics as a Coordination Problem: The Contributions of Friedrich A. Hayek*. Kansas City: Sheed Andrews and McMeel.
- Eucken, Walter. 1937. "Vom Hauptproblem der Kapitaltheorie," *Jahrbücher für Nationalökonomie und Statistik* 145, no. 5: 533-564.
- . 1940. "Der Wirtschaftsprozess als zeitlicher Hergang," *Jahrbücher für Nationalökonomie und Statistik* 152, no. 1: 113-152.
- Floud, Roderick. 1976. *The British Machine Tool Industry, 1850-1914*. Cambridge: Cambridge University Press.
- Garrison, Roger. 2001. *Time and Money*. London and New York: Routledge.
- Gehrke, Christian. 2003. "The Ricardo Effect: Its Meaning and Validity," *Economica* 70, no. 277: 143-158.
- Gilbert, J.C. "Professor Hayek's Contribution to Trade Cycle Theory." In Jack K. Eastham, ed., *Economic Essays in Commemoration of the Dundee School of Economics, 1931-1955*. Perthshire, U.K.: Coupar Angus, 51-62.
- Haberler, Gottfried. 1943. *Prosperity and Depression*. Geneva: League of Nations.

- . 1986. "Reflections on Hayek's Business Cycle Theory," *Cato Journal* 6: 421.
- Hagemann, Harald, and Hans-Michael Trautwein. 1998. "Cantillon and Ricardo Effects: Hayek's Contributions to Business Cycle Theory," *Journal of the History of Economic Thought* 5, no. 2: 292–316.
- Hayek, Friedrich A. 1935. *Prices and Production*. In Joseph T. Salerno, ed., *Prices and Production and Other Works*. Auburn, Ala.: Ludwig von Mises Institute, 2008.
- . 1936. "Technical Progress and Excess Capacity." In Roy McCloughry, ed., *Money, Capital and Fluctuations: Early Essays*. London: Routledge and Kegan Paul, 1984, 163–180.
- . 1939. *Profits, Interest, and Investment, and other Essays on the Theory of Industrial Fluctuations*. In Hansjörg Klausinger, ed., *The Collected Works of F.A. Hayek, Volume 8, Business Cycles Part II*. 2012.
- . 1941. *The Pure Theory of Capital*. Auburn, Ala.: Ludwig von Mises Institute, 2009.
- . 1942a. "The Ricardo Effect." In Hansjörg Klausinger, ed., *The Collected Works of F.A. Hayek, Volume 8, Business Cycles Part II*. 2012.
- . 1942b. "A Comment." In Hansjörg Klausinger, ed., *The Collected Works of F.A. Hayek, Volume 8, Business Cycles Part II*. 2012.
- . 1946. "Full Employment Illusions." In *A Tiger by the Tail. The Keynesian Legacy of Inflation*. Auburn, Ala.: Ludwig von Mises Institute, 2009.
- . 1969. "Three Elucidations of the Ricardo Effect." In Hansjörg Klausinger, ed., *The Collected Works of F.A. Hayek, Volume 8, Business Cycles Part II*. 2012.
- Huerta De Soto, Jesús. 2006. *Money, Bank Credit, and Economic Cycles*. Trans. Melinda A. Stroup. Auburn, Ala.: Ludwig von Mises Institute.
- Kaldor, Nicholas. 1937. "Annual Survey of Economic Theory: The Recent Controversy on the Theory of Capital," *Econometrica* 5, no. 3: 201–233.
- . 1939. "Capital Intensity and the Trade Cycle." *Economica*, N.S. 6, no. 21: 40–66.
- . 1942. "Professor Hayek and the Concertina-Effect," *Economica*, N.S. 9, no. 36: 359–382. In Hansjörg Klausinger, ed., *The Collected Works of F.A. Hayek, Volume 8, Business Cycles Part II*. 2012.

- Keynes, John M. 1930. *A Treatise on Money*, vol. 2: *The Applied Theory of Money*. New York: Harcourt, Brace.
- Klausinger, Hansjörg. 2011. "Hayek and Kaldor: Close Encounter at LSE," *History of Economic Ideas* 19, no. 3: 135–163.
- . 2012. "Introduction." In Hansjörg Klausinger, ed., *The Collected Works of F.A. Hayek, Volume 8, Business Cycles Part II*, 1–43.
- Lachmann, Ludwig M. 1940. "A Reconsideration of the Austrian Theory of Industrial Fluctuations," *Economica*, N.S. 7, no. 26: 179–196.
- Lachmann, Ludwig M., and F. Snapper. 1938. "Commodity Stocks in the Trade Cycle," *Economica*, N.S. 5, no. 20: 435–454.
- Lowe, Adolph. 1976. *The Path of Economic Growth*. Cambridge: Cambridge University Press.
- Lutz, Friedrich A. and Vera Lutz. 1951. *The Theory of Investment of the Firm*. Princeton: Princeton University Press.
- Machlup, Fritz. 1940. *The Stock Market, Credit and Capital Formation*. Auburn, Ala.: Ludwig von Mises Institute, 2007.
- Mises, Ludwig von. 1949. *Human Action*. Scholars ed. Auburn, Ala.: Ludwig von Mises Institute, 1998.
- Moss, Laurence S., and Karen I. Vaughn. 2010. "Hayek's Ricardo Effect: A Second Look," *American Journal of Economics and Sociology* 69, no. 1: 333–358. Reprinted from *History of Political Economy* 18: 545–565 (1986).
- Nurkse, Ragnar. 1935. "The Schematic Representation of the Structure of Production," *Review of Economic Studies* 2, no. 3: 232–244.
- Overstone, Baron Samuel Jones Loyd. 1857. *Tracts and other Publications on Metallic and Paper Currency*. New York: Augustus M. Kelly, 1972.
- Salerno, Joseph T. 2012. "A Reformulation of Austrian Business Cycle Theory in Light of the Financial Crisis," *Quarterly Journal of Austrian Economics* 15, no. 1: 3–44.
- Steele, Gerald R. 1988. "Hayek's Ricardo Effect," *History of Political Economy* 20, no. 4: 669–672.
- Weitzman, Martin L. 1971. "Shiftable versus Non-Shiftable Capital: A Synthesis," *Econometrica* 39, no. 3: 511–528.

- White, Lawrence H. 2007. "Introduction." In Lawrence H. White, *The Collected Works of F.A. Hayek, Volume 12, The Pure Theory of Capital*. Chicago: University of Chicago Press.
- Wicksell, Knut. 1934. *Lectures on Political Economy, Vol. 1*. New York: Augustus M. Kelley, 1967.
- Wilson, Tom. 1940. "Capital Theory and the Trade Cycle," *Review of Economic Studies* 7, no. 3: 169–179.

IS GARRISON'S NOTION OF "SECULAR GROWTH" COMPATIBLE WITH THE SOLOW GROWTH LITERATURE?

ROBERT P. MURPHY

ABSTRACT: Roger Garrison (2001) employs the concept of "secular growth" in which a one-shot (but permanent) fall in time preferences can yield a long string of doses of net investment, so long as gross saving exceeds depreciation. However, Salerno (2001) argues that secular growth is incompatible with orthodox Austrian capital theory, and suggests ways that Garrison's appeal to neoclassical readers can be maintained while respecting the framework bequeathed by Rothbard. Commenting on the dispute, Young (2009) argues—perhaps ironically—that the mainstream growth literature, steeped in the famous Solow model, comes down on the side of Salerno. The present paper clarifies some ambiguities in Young's discussion, and then argues that Garrison's usage of "secular growth" is more likely to resonate with a neoclassical reader than Salerno's approach. To be sure, Rothbardians may ultimately reject Garrison's standard exposition (because of Salerno's objections), but *Time and Money* still represents a smooth gateway to introduce neoclassical readers to capital-based macroeconomics

KEYWORDS: Solow growth model, secular growth, capital theory

JEL CLASSIFICATION: B25, E21, E22, O11, O12, O16, O43

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I. INTRODUCTION

Roger Garrison's (2001) *Time and Money*, and its accompanying PowerPoint presentations,¹ provide a creative graphical exposition of Austrian macroeconomics in the form of three interlocking diagrams. Specifically, Garrison relates the Hayekian triangle to the "Production Possibilities Frontier" (PPF) so familiar in mainstream textbooks, which in turn he links to a standard loanable funds diagram familiar to Austrians and neoclassicals alike. Besides making for an entertaining seminar presentation, Garrison's framework thus tells the Mises-Hayek business cycle story in a way that neoclassical economists can understand.²

Although he appreciates Garrison's return to the fundamentals of Austrian capital, interest, and business cycle theory—what Garrison himself dubs "capital-based macroeconomics"—Joseph Salerno (2001) worries that Garrison has unwittingly employed an analytical concept that conflicts with the verbal-logical foundations of Austrian macroeconomics. Specifically, Garrison adopts a baseline of "secular growth" as more realistic than a stationary (no growth) economy. As Garrison defines the term:

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. (Garrison, 2001, p. 54)

Salerno (2001) argues that this concept of secular growth is dubious from an Austrian perspective. For one thing, Garrison's discussion suggests that during periods of secular growth the economy is on "autopilot" (my term), whereas the Mengerian tradition roots Austrian analysis as *causal* from the foundations of the School.³

¹ Garrison's series of PowerPoint presentations are available at <https://www.auburn.edu/~garriro/tam.htm>.

² To be sure, not all Austrians are happy with Garrison's approach. For example, Barnett and Block (2006) reject the Hayekian triangle outright, while Hülsmann (2001) argues that Garrison's approach to money "is irreconcilable with the standpoint developed in the writings of Menger, Mises, Rothbard, and others," and indeed that "Garrison's macroeconomics is...macroeconomics without money" (p. 34).

³ Salerno (2010) establishes Menger as the founder of a "causal-realist" tradition which was then elaborated by Mises and Rothbard.

More specifically, Salerno reminds us that in Rothbard's treatment (which he viewed as merely elaborating capital theory in the tradition of Böhm-Bawerk, Mises, and Hayek), a change in time preferences corresponds to a new resting state. There may be a transition period as the production structure evolves, but in the Austrian framework

[t]he increase in real income resulting from a given dose of net investment does not buy, as it were, an automatic and continuous flow of extra capital goods that can be utilized for further extensions of the structure of production; all capital goods created by an act of net saving are fully absorbed in maintaining the enhanced flow of real income characterizing the new stationary economy. (Salerno, 2001, p. 45)

Salerno then illustrates his position with a numerical Robinson Crusoe example, in which each period Crusoe engages in discrete acts of net saving, jumping from one stationary economy to the next, in a succession of growing output. Although superficially this may seem like Garrison's "secular growth," Salerno argues that it is quite distinct, because each jump involves a further drop in time preference and a conscious decision to accumulate additional capital goods.

I agree with Salerno that Garrison's notion of "secular growth" is at odds with Rothbard's treatment in *Man, Economy, and State* (2004 [1962]). There, a one-shot (and permanent) fall in the community's time preferences results in a new *stationary state* for the economy, with a lower interest rate, deeper capital structure, and higher gross investment to maintain it.⁴ But in Rothbard's approach, once the economy adjusts to the new parameters, the process stops; we are back in a long-term equilibrium unless something disturbs it. In particular, there is no reason for the capital stock to *continue* growing, or for the flow of consumer goods to *continue* rising.

However, in the present paper we are not asking whether Garrison or Salerno has the approach to capital accumulation that is more compatible with Rothbard. Rather, here we focus attention on the narrow question of, "What approach is more likely to resonate with

⁴ For a numerical illustration of Rothbard's approach to modeling the economy's growth in response to a one-shot drop in time preferences, see Murphy (2006) pp. 96–98.

the way neoclassical economists think about capital accumulation?" At first blush, it would seem that Garrison comes out the clear winner, largely because of the way mainstream economists define their terms. In Section II of this paper, we will spell out this affinity between mainstream economics and Garrison's terminology.

Yet even though I believe it will be easy to demonstrate that mainstream economists would quickly identify with Garrison's treatment of secular growth, ironically Young (2009) reaches the opposite conclusion. Specifically, Young (2009) argues that neoclassical readers, familiar with the growth literature based on the famous Solow model, would agree *with Salerno's* take on the concept of secular growth. In Section III of this paper, I will show that although superficially plausible, Young's argument falls apart when we consider the *time* involved in moving to a new "steady state" in the Solow model. Notwithstanding the well-known results of the Solow model concerning savings rates and economic growth, it is still the case that mainstream economists would side with Garrison's definition of "secular growth" over Salerno's approach.

II. THE TERMINOLOGY OF MAINSTREAM GROWTH ACCOUNTING

In abstract mathematical models of the economy—such as the canonical Solow growth model—it is customary to treat savings and investment the way that Garrison does in his book. In particular, if we start at a steady-state of no growth, where gross savings each period just balances physical depreciation, and then we suddenly increase the savings rate, there will be a succession of periods of what mainstream economists would label "net investment," defined as that portion of gross investment that exceeds depreciation.⁵ (We will go over specific numerical examples of this phenomenon in Section III.)

The mainstream approach lines up perfectly with Garrison's notion of secular growth in which "the ongoing gross investment is sufficient for both capital maintenance and capital accumulation" (Garrison, 2001, p. 54). In other words, during a period of

⁵ A standard graduate level text is Romer (1996), and its introduction and discussion of the basic Solow model is covered in Chapter 1.

secular growth, gross investment is high enough that it contains a component covering both depreciation (“capital maintenance”) and a remainder for net investment (“capital accumulation”).

To reiterate, this is how mainstream economists use these terms. To be sure, this labeling would not be due to deep philosophical considerations, but would instead be a matter of definition, carried over from a straightforward accounting treatment in the business world. For example, consider this discussion drawn from Investopedia.com’s entry on “Net Investment”:

If gross investment is consistently higher than depreciation, net investment will be positive, indicating that productive capacity is increasing. Conversely, if gross investment is consistently lower than depreciation, net investment will be negative, indicating that productive capacity is decreasing, which can be a potential problem down the road.⁶

Thus we see that as a simple matter of definitions, mainstream economists would immediately understand what Garrison means when he describes secular growth occurring when gross investment exceeds depreciation, leading to net investment. In particular, if intertemporal preferences should suddenly change and disrupt an original “steady state” equilibrium, mainstream economists would endorse Garrison’s framework in which there would be many succeeding periods of positive net investment, while the growing capital stock (and hence growing depreciation each period) had not yet caught up with the sudden jump in gross saving/gross investment.

In contrast, I do not think the standard mainstream economist—used to thinking about capital as an aggregate quantity “K”—would be able to make much sense of Salerno’s discussion. Salerno’s point is that an Austrian theorist must view capital as a collection of *specific capital goods* with specific ends to serve, and in that framework, there are difficulties with Garrison’s approach. Yet these types of worries are not ones that would bother a mainstream economist. He or she would immediately adopt Garrison’s approach to savings rates, gross vs. net investment, and hence secular growth.

⁶ Quotation taken from: <http://www.investopedia.com/terms/n/netinvestment.asp>, accessed January 11, 2017.

III. ANDREW YOUNG PITS SOLOW AGAINST GARRISON

In the previous section, I argued that simply by a matter of definition—and because they think of capital in aggregates like “K” rather than as concrete capital goods embedded in a subjective plan—mainstream economists would more easily embrace Garrison’s approach to “secular growth” than Salerno’s framework. However, there is one glaring complication to my argument: it is well-known in the growth literature that a higher savings rate *cannot* explain permanent differences in growth rates between countries, at least if we use standard models such as the Solow model.

Aware of this fact, Young (2009) weighs in on the Garrison/Salerno dispute over secular growth, and explains why he thinks neoclassical economists would declare Salerno the victor:

Salerno argues that, in the absence of technological or institutional change, time preferences must be falling over time for capital accumulation to be sustainable. Furthermore, Salerno’s argument echoes one of the primary conclusions of neoclassical growth theory [references omitted].... As Robert Lucas (2002, p. 29) summarizes: the theory “emphasizes a distinction between ‘growth effects’...and ‘level effects.’...[C]hanges in savings rates are level effects....” **In the absence of technological change, only a continually rising savings rate (and falling rate of time preference) can result in secular growth.**

[...]

Either Salerno’s argument or that of neoclassical growth theory poses a challenge to Garrison’s theory of secular growth. Furthermore, despite their differences, there is little, if anything, contradictory between the two arguments. Most Austrians are not uncomfortable with diminishing returns, and neoclassical growth theorists would not likely deny that more capitalistic methods of production are also more time-consuming. (Young 2009, pp. 36–37, italics in Young’s original, bold added.)

Although Young’s general summary of the neoclassical growth literature is correct, there are some slight nuances in his handling of the matter that—in this case—actually defeat the purpose of his argument. To demonstrate this, I will first present two numerical counterexamples, and then I will explain in broad terms why Young is wrong to pit the Solow model against Garrison.

Counterexample #1 to Young: Perpetual Growth Despite Diminishing Returns and Constant Savings Rate

The standard Solow growth model—which we will exposit in discrete time—relates output to the input of homogenous capital and homogenous labor:

$$Y_t = F(K_t, L_t)$$

Every period, output is divided between consumption and investment. Furthermore, capital grows with investment but every period depreciates at some rate δ , where $0 \leq \delta < 1$. These considerations give the equations:

$$Y_t = C_t + I_t$$

$$K_{t+1} = K_t + I_t - \delta K_t$$

One of the defining features of the Solow model (which is relaxed in later models in the neoclassical growth literature) is that the savings rate s , where $0 < s < 1$, is exogenous and constant (at least for purposes of determining the “steady state” equilibrium). This gives us:

$$I_t = sY_t$$

$$K_{t+1} = K_t + sY_t - \delta K_t$$

$$K_{t+1} = K_t + sF(K_t, L_t) - \delta K_t$$

In standard expositions of the Solow model, there are more assumptions on the growth of the population, and of a technology parameter that “augments” the labor stock. For our purposes, we can dispense with these complexities, and hold technology and population constant. For simplicity, we will set the labor supply to 1 for all periods.

In this first counterexample, we will set $\delta=0$, meaning that there is no physical depreciation in the capital stock. Further, we set $Y_t = F(K_t, L_t) = (K_t)^{1/2}(L_t)^{1/2} = (K_t)^{1/2}$. That is, output every period is equal to the square root of the size of the capital stock that period.⁷ Notice that our production function is an example of the Cobb-Douglas class, with the shares of capital and labor each set to $1/2$.

⁷ Because we have chosen $L_t=1$ for all t , labor’s contribution to output falls out of the equation.

With this setup, in Table 1 we simulate the evolution of an economy where the initial capital stock is 100.

Table 1: Counterexample # 1: An economy with diminishing returns and constant savings rate, yet perpetual growth

s=10% delta = 0% Y = SQRT(K)					
TIME	K(t)	Output	Net Investment (=Growth in K)	Growth in Output	Growth in Net Investment
0	100.000	10.000	N / A	N / A	N / A
1	101.000	10.050	1.000	0.050	N / A
2	102.005	10.100	1.005	0.050	0.005
3	103.015	10.150	1.010	0.050	0.005
4	104.030	10.200	1.015	0.050	0.005
5	105.050	10.249	1.020	0.050	0.005
...
50	156.111	12.494	1.244	0.050	0.005
51	157.360	12.544	1.249	0.050	0.005
52	158.615	12.594	1.254	0.050	0.005
53	159.874	12.644	1.259	0.050	0.005
54	161.139	12.694	1.264	0.050	0.005
55	162.408	12.744	1.269	0.050	0.005
...
100	224.697	14.990	1.494	0.050	0.005
101	226.195	15.040	1.499	0.050	0.005
102	227.699	15.090	1.504	0.050	0.005
103	229.208	15.140	1.509	0.050	0.005
104	230.722	15.190	1.514	0.050	0.005
105	232.241	15.239	1.519	0.050	0.005
...
195	389.392	19.733	1.968	0.050	0.005
196	391.365	19.783	1.973	0.050	0.005
197	393.343	19.833	1.978	0.050	0.005
198	395.326	19.883	1.983	0.050	0.005
199	397.315	19.933	1.988	0.050	0.005
200	399.308	19.983	1.993	0.050	0.005

In Table 1, we see that the simulated economy enjoys perpetual (and constant) growth, as measured in absolute terms. Specifically, total real output grows by 0.05 units every period. Every period, the additional volume of output is split 10/90 between investment and consumption: Specifically (and as shown in the last column), net investment itself grows by 0.005 units each period, whereas consumption grows by 0.045 units (though space constraints prevent us from showing this in the table). Be careful not to become confused with rates of change: investment (like consumption) is a *flow* variable that, in this numerical example, itself increases linearly over time. However, the total amount of capital in each period is a *stock* variable that, in this example, grows exponentially over time.

Note that in this specific numerical example, *there is no steady-state* to which the economy moves; real output is 0.05 units higher every period, forever. Each period, the community enjoys 0.045 units of more (real) consumption, forever. Furthermore, this perpetual growth occurs despite the fact that we assumed a constant savings rate, and furthermore chose a production function (of the standard Cobb-Douglas class) that exhibits diminishing returns. That is to say, it is still true in this example that a *given* increase in K leads to ever smaller increases in Y (and hence investment and consumption) as K grows larger. (Thus, if this hypothetical economy experienced a perpetual stream of net investment of *the same absolute size* every period, then in the long run, the increase in real output each period would tend towards zero.) Nonetheless, there is no tendency in this economy for the growth in real output to asymptotically approach zero, even though there is a constant savings rate and a typical production function. On the contrary, real output grows without limit. Rereading Young's block quotation above, and contrasting his description with our specific example, it is clear that something is amiss.

The "trick" we've used in Counterexample #1—and which is driving the results that probably strike most readers as initially counterintuitive—is that even though the derivative⁸ of the production function with respect to K is diminishing as K increases, that feature does *not* imply that output is diminishing

⁸ Of course the derivative is only defined if we recast the model in continuous, not discrete, terms.

with respect to t . As the "Net Investment" column indicates, the periodic increments in K themselves constantly increase over time. Therefore, even though a *given* dose of additional capital will yield ever diminishing increments in output, *perpetually increasing* doses of additional capital can yield a constant increment in output over time.⁹ Indeed, that is exactly what we have illustrated in Table 1.

To be sure, the model depicted in Counterexample #1 is not very realistic. (In the next section we address this concern.) Yet it served the purpose of isolating the role that different assumptions play in yielding the standard results of the Solow model. In particular, Counterexample #1 showed that a constant savings rate plus "diminishing returns in the production function" do *not* rule out perpetual growth in real output, even though one might have thought otherwise from reading Young's discussion of the neoclassical growth literature. It should go without saying that Young is aware of the importance of depreciation in these models, but nonetheless the results in Table 1 may be counterintuitive for many readers, and it is important to show that "diminishing returns" by itself does not prevent perpetual growth.

Counterexample #2 to Young: Long-Term (Secular?) Growth Even with Depreciation

An obvious objection to our first counterexample is that it did not include physical depreciation of the capital stock, and thus may have been an unfair test of Young's position.¹⁰ I have two responses to such an objection.

⁹ We can switch our Solow model to continuous time to verify analytically that our claims do indeed hold, and are not just a fluke of Excel rounding and (perhaps) an inadequate length of time in the simulation. Specifically, with $Y(t) = K(t)^{1/2}$, and with $dK/dt = (0.1) * Y(t)$, we can use calculus and substitution to determine that the second derivative of $K(t)$ with respect to t is always $+0.005$, and that the derivative of $Y(t)$ with respect to t is always $+0.05$. Thus, the relevant columns in Table 1 are not misleading; they accurately depict the operation of the Solow model with our chosen parameters. Additionally, we can determine that $K(t) = [(0.05)t + K(0)^{1/2}]^2$, which grows without limit as t tends to infinity.

¹⁰ In his comment on Young, Engelhardt (2009) also emphasizes the importance of depreciation in the analysis. Specifically, Engelhardt argues that it is not positive externalities, but rather the assumption of no depreciation, that drives Young's own model of secular growth.

First, even if it were true that employing a positive depreciation rate “fixed” everything and made secular growth once again appear untenable, my first counterexample would still underscore that Young’s emphasis on diminishing returns was not the full story. Young did not mention depreciation in his attempt to unite Salerno with the neoclassicals, and thus Counterexample #1 would be useful if only to clarify the terms of the marriage.

Second and more important, even when we add a positive depreciation rate to the Solow model, it still can take many periods—what we might interpret as “a long time”—for the periodic increases in real output to peter out. We illustrate this possibility in Table 2 where we have made the depreciation rate 5 percent of the existing capital stock, and where we have changed the initial capital stock to 1.000 to make the first few calculations intuitive.

Table 2: Counterexample #2: An economy with diminishing returns, constant savings rate, and depreciation, yet long-lasting growth

	s=10%	delta = 5%	Y = SQRT(K)		
TIME	K(t)	Output	Net Investment (=Growth in K)	Growth in Output	Growth in Net Investment
0	1.000	1.000	N / A	N / A	N / A
1	1.050	1.025	0.050	0.025	N / A
2	1.100	1.049	0.050	0.024	0.0000
3	1.150	1.072	0.050	0.024	-0.0001
4	1.200	1.095	0.050	0.023	-0.0001
5	1.249	1.118	0.050	0.022	-0.0002
...
50	2.945	1.716	0.025	0.007	-0.0005
51	2.969	1.723	0.024	0.007	-0.0005
52	2.993	1.730	0.024	0.007	-0.0005
53	3.016	1.737	0.023	0.007	-0.0005
54	3.039	1.743	0.023	0.007	-0.0005
55	3.062	1.750	0.022	0.006	-0.0005
...
100	3.686	1.920	0.008	0.002	-0.0002
101	3.693	1.922	0.008	0.002	-0.0002
102	3.701	1.924	0.008	0.002	-0.0002
103	3.708	1.926	0.007	0.002	-0.0002
104	3.715	1.928	0.007	0.002	-0.0002
105	3.722	1.929	0.007	0.002	-0.0002
...
195	3.971	1.993	0.001	0.000	0.0000
196	3.972	1.993	0.001	0.000	0.0000
197	3.973	1.993	0.001	0.000	0.0000
198	3.973	1.993	0.001	0.000	0.0000
199	3.974	1.993	0.001	0.000	0.0000
200	3.975	1.994	0.001	0.000	0.0000

With our chosen parameter values, the typical neoclassical economist would characterize the “steady state” equilibrium by noting that when $K_t = 4$, investment exactly counterbalances

depreciation.¹¹ If the capital stock were ever to exceed the level of 4, then depreciation would exceed gross investment and the capital stock would decline. Thus, once we add in physical depreciation, a constant savings rate—coupled with diminishing returns to capital in the production function—means that real output will indeed approach a plateau. In this case, real output will settle down in the steady state at a level of $\text{SQRT}(4) = 2$.

However, does this mean that Young is right after all, and that a typical neoclassical growth model leaves no room for secular growth in the Garrisonian sense? I would argue no. As Table 2 shows, even though real output is bounded above, it can grow by significant amounts for extended periods.

For example, we can imagine that Table 2 shows the evolution of an economy that starts with an initial savings rate of 5 percent, and then suddenly doubles the savings rate to 10 percent. Note that the time 0 values would constitute an original steady state at the lower savings rate (or higher time preference rate). Specifically, at time 0, if the savings rate is 5 percent, and the capital stock is 1, then investment just balances depreciation.

Now the rest of the table shows what happens if, for some reason, we disrupt that initial steady state by having time preferences suddenly fall, such that the constant savings rate jumps up to 10 percent. In Garrisonian terms, in the immediate aftermath of this preference change, gross investment is more than sufficient to cover depreciation, so that there is net investment—the capital stock grows. Garrison would label this as a period of secular growth.

Now Salerno (and Young) would presumably argue that no, this is not genuine secular growth, because it merely represents a transition period to the new steady state. In particular, once capital has quadrupled to 4, and real output has doubled to 2, gross investment will once again be adequate only to just offset depreciation. Net investment will have fallen to zero.

¹¹ In this case, total output is $\text{SQRT}(4) = 2$. A savings rate of 10 percent thus implies gross investment of 0.2. But the 5 percent physical depreciation rate on the 4 units of capital implies total depreciation of 0.2, which totally absorbs the gross investment leaving 0 net investment. The capital stock will thus be 4 next period, and the period after, forever.

That is certainly true, but consider the *length* of this transition period. For one thing, the economy will never *quite* attain the new steady state, but will only asymptotically approach it. (Such an asymptotic approach is clearly not how Salerno is thinking about the issues, when he has in mind a transition to a new production structure consisting of particular capital goods.) Yet more significant than this mathematical trivia, is the *proportion* of the ultimate increase that has yet to be reaped after a significant passage of time. For example, note that by period 55, real output is 1.75 units, which is only seven-eighths of its steady state value. If we interpret time periods to be years, then the "transition period" (to which Salerno and Young wish to deny the label "secular growth") spans at least two generations.

The Speed of Adjustment in the Neoclassical Growth Literature

Our conclusion from Counterexample #2—namely, that the speed of convergence to a new steady state can take a long time—corresponds with the neoclassical growth literature's attempts to calibrate their models to real economies. For example, using standard parameter values for population growth, depreciation, capital's share of income, and so forth, Romer (1996) writes in his graduate macro textbook, in his discussion of the Solow model:

Thus in our example of a 10% increase in the saving rate, output is $0.04(5\%) = 0.2\%$ above its previous path after 1 year; is $0.5(5\%) = 2.5\%$ above after 18 years; and asymptotically approaches 5% above the previous path. Thus not only is the overall impact of a substantial change in the saving rate modest, but it does not occur very quickly. (Romer, 1996, pp. 22–23)

To paraphrase Romer's analysis, he is saying that when we plug plausible parameters into the Solow growth model, an increase in the savings rate from, say, 20 percent to 22 percent would eventually boost output by 5 percent relative to the original level. However—and this is crucial for our discussion—after the first 18 years of the sudden jump in savings, output would only have closed *half* of the gap to its new steady-state level.

For another example showing how neoclassical economists view time in growth models, consider the following commentary on a

transition from a capital stock below the “golden rule” (GR) level—which, by definition, maximizes steady-state consumption—up to the GR level:

Note that in the transition to the GR [Golden Rule] point, there will be “initial” effects and “long-run” effects. Say we’re below the GR. As we increase savings, there will be a temporary decrease in consumption, and then a long run increase. Why? Because an increase in savings means less consumption right away.... However, as capital accumulates, output increases, and thus so does consumption. This situation gives us a look into why it’s called the Golden Rule...because we sacrifice consumption now for higher consumption for the people of the future. As Mankiw puts it, the welfare of all generations is given equal weight, so sacrifice by this generation is outweighed by the gains of future generations. (Sanders, 2008, p. 4, emphasis added)

As this commentary (which is taken from study notes on the Solow model) indicates, when neoclassical economists say that a higher savings rate cannot explain economic growth, they may be thinking in terms of *generations*. The time frame is much much longer than, say, Salerno’s thought experiment of Crusoe building a house over the course of 3,000 hours.

Discussion

To be sure, I am not *endorsing* the way that typical neoclassical economists deploy the Solow model when interpreting economic statistics. In particular, I have argued elsewhere that Romer (who is merely echoing the rest of the profession) is plunging headlong into the fallacy of the naïve productivity theory of interest that Böhm-Bawerk brilliantly refuted so long ago. (Murphy, 2005)

Instead, my modest point is that when economists such as Robert Lucas (whom Young quoted) say that a constant savings rate can only explain level effects, not growth effects, this observation does *not* pose a problem for Garrison and his notion of secular growth. As we have seen, the standard Solow model—calibrated with plausible parameter values—predicts that a one-time increase in the savings rate would lead to a permanently higher (but constant) level of output, but that this transition process could take *decades* before the bulk of the increase had been reaped. During those decades, gross investment would be higher than depreciation,

such that the capital stock would grow with each successive burst of "positive net investment" (defined in the standard way that accountants and business owners would use the terms). Is this not entirely compatible with the Garrisonian framework?

Young is certainly correct when he points out that the typical neoclassical growth literature—at least with models that exclude the type of positive externalities from investment that Young believes will solve Garrison's problem—has no room for growth in the steady state as a result of mere capital accumulation.

However, what the neoclassical economist means by "growth in the steady state" is not exactly the same concept as "secular growth" in Garrison's framework. Now perhaps Garrison *did* intend to suggest that an economy could experience rightward shifts in its Production Possibilities Frontier (PPF) indefinitely, as the result of a one-shot increase in the savings rate. *That* would indeed be inconsistent with the neoclassical literature, and indeed would be hard to reconcile with diminishing returns and (physical) depreciation. However, in his diagrams in *Time and Money* as well as his PowerPoint presentations, Garrison only shows a few periods of secular growth in response to a fall in time preference, all of which is perfectly consistent with the neoclassical treatment.¹²

¹² Even if he did not intend it, Garrison's descriptions could understandably mislead some readers into thinking that a one-shot change in the savings rate could fuel perpetual growth, even with physical depreciation. For example, in his 2003 PowerPoint presentation on "Sustainable and Unsustainable Growth"—available at <https://www.auburn.edu/~garrir/pptsus.ppt>—at one point in the demonstration the slide reads: "With gross investment greater than capital depreciation, the economy experiences secular growth. This rate of growth is sustainable." Strictly speaking, Garrison no doubt means that investments that occur because of a (one-shot) fall in time preferences, wherein gross investment exceeds depreciation, will not lead to a boom-bust cycle. However, his statement is definitely liable to lead some readers to conclude that the economy will continue this ("sustainable") growth indefinitely, and that indeed this is the baseline of real-world economic growth upon which we add technological innovations. If that *is* what Garrison was trying to convey, then Young is certainly correct: neoclassical economists would argue that such an analysis ignores the straightforward implications of the standard Solow model. Specifically, if we assume diminishing returns to physical capital, and that depreciation is proportional to the stock of capital, then for fixed technology and a constant savings rate, the economy will eventually reach a "steady state" where gross investment just covers physical depreciation.

IV. CONCLUSION

Garrison's definition of "net investment" accords with the way accountants, business people, and neoclassical economists use the term. As such, his related notion of "secular growth" will also resonate with mainstream economists. Salerno is right that Garrisonian secular growth is hard to reconcile with Rothbardian capital theory. However, perhaps the primary virtue of *Time and Money* is its exposition of capital-based macroeconomics in terminology and graphs that non-Austrian economists can understand. On this criterion, Garrison's "secular growth" passes with flying colors.

There is an admitted complication that Andrew Young has brought up: a well-known result in the growth literature is that a sudden increase in the savings rate *does not* lead to permanently higher growth in the Solow model. However, all this means is that Garrison should be clear that his concept of secular growth is not *permanent*, but rather can last "only" 50 years (with plausible parameter values). This presents no problem for his book's graphs or his PowerPoint presentations, since they only show a few years of "secular growth" where the PPF shifts outward in response to a one-shot increase in savings. There is nothing in Garrison's exposition that depends on secular growth lasting literally forever, as opposed to (say) only 50 years.

In other words, Garrison's treatment is entirely compatible with the neoclassical growth literature so long as he clarifies that his "secular growth" is a *long-run* but not an *infinitely long* phenomenon.

REFERENCES

- Barnett, William II and Walter E. Block. 2006. "On Hayekian Triangles," *Procesos De Mercado: Revista Europea De Economia Politica* 3, no. 2: 39–141. Available at <http://mises.org/journals/scholar/block18.pdf>; http://www.academia.edu/1359916/On_Hayekian_Triangles
- 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. 2001. *Time and Money: The Macroeconomics of Capital Structure*. London: Routledge.

- Hülsmann, Jörg Guido. 2001. "Garrisonian Macroeconomics," *Quarterly Journal of Austrian Economics* 4, no. 3: 33–41.
- Murphy, Robert P. 2005. "Dangers of the One-Good Model: Böhm-Bawerk's Critique of the 'Naïve Productivity Theory' of Interest," *Journal of the History of Economic Thought* 27, no. 4: 375–382.
- . 2006. *Study Guide to Murray Rothbard's Man, Economy, and State with Power and Market*. Auburn, Ala.: Ludwig von Mises Institute.
- Romer, David. 1996. *Advanced Macroeconomics*. New York: McGraw-Hill.
- Rothbard, Murray N. 2004. *Man, Economy, and State with Power and Market*. Scholar's Edition. Auburn, Ala.: Ludwig von Mises Institute.
- 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.
- . 2010. "Menger's Causal-Realist Analysis in Modern Economics," *Review of Austrian Economics* 23, no. 1: 1–16.
- Sanders, Nick. 2008. "Chapters 7 and 8—Solow Growth Model Basics," study notes for UC Davis Department of Economics. Available at: http://njsanders.people.wm.edu/101/Ch7_8_Handout.pdf.
- Young, Andrew T. 2009. "A Capital-Based Theory of Secular Growth," *Quarterly Journal of Austrian Economics* 12, no. 3: 36–51.

SECULAR GROWTH IN GARRISON'S MODEL: A COMMENT

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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,

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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 known 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 understanding 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.

A NOTE ON BLOCK-HOPPE DEBATE ON INDIFFERENCE

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ABSTRACT: This paper addresses the debate on indifference within the remit of praxeology, as unfolded between Hoppe and Block. It argues that the whole controversy between the two authors stem from the fact that they conceive of *choice* differently. Simultaneously, there is an attempt made to sharpen the authors' respective positions and to scrutinize the implications thereof while confronting them with our common-parlance linguistic intuitions. In other words, the paper pretends to show what follows from both positions on *what is chosen*; that is, what sorts of elements does an opportunity set consists of (be it, as will be argued, psychologically and intensionally defined end-states or particular action-tokens). Finally, the paper is concluded by demonstrating relative merits of the Blockian position over the Hoppean one as the former appears to be closer to the letter of praxeology as such.

KEYWORDS: indifference, choice, praxeology

JEL CLASSIFICATION: A10, B40, D01

The debate under scrutiny here extended throughout as many as four papers and still seems unresolved. Therefore, far from claiming to provide a conclusive solution, I posit that the entire controversy is misconstrued in that it employs the notion

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of *choice* equivocally. How does Hoppe interpret *choice* and what exactly does his ingenious and elegant device achieve?¹ It seems that it clearly draws the demarcation line between choice and indifference. A choice occurs *always under strict preference*; whereas indifference, as not being acted upon, is conceived of as a psychological relation holding between the equally valued options (described in psychological and intensional terms), which the subject does not (and cannot) choose between. On the other hand, Block (2009, p. 57) believes that Hoppean resourceful description misses the mark and cannot make sense of an *actual choice*, as conceived of by Block. Block invokes an example of a transaction between a butter vendor and his customer. The former disposes of one unit of butter, while the latter pays with a *particular* note. Block hastens to add that the vendor “does not at all choose ‘a’ unit of butter. Rather he picks a *specific* one. [...] And, it is the same with the buyer. He picks a *specific* dollar with which to pay for the butter, not, merely ‘a’ dollar.” The said divergence between the two authors is readily noticeable now. The Blockian conception of choice seems to be about the *specifics* of the state of affairs brought about by an economic actor. After all, it is quite telling that Block employs the concept of *picking up* (or *choosing*) when it comes to the vendor’s giving up a particular unit of butter and to the customer giving up one of his notes. It is needless to say that Hoppe would construe of this transaction as follows, the choices being (in the descending order of value):

- 1) Giving up a unit of butter and getting a note of money
- 2) Not giving up a single unit of butter but getting no unit of money,

¹ Hoppe effectively says that if a person is genuinely indifferent between a pair of options A and B (they are equally valued by him), and B and C (they are also equally valued but occupy a lower position on the person’s value scale), then the person’s choice (as understood normally) between A, B, C, D is in fact reducible to the choice between the following two disjunctive alternatives:

- 1) A xor B
- 2) C xor D, where xor denotes a disjunctive alternative.

On the face of it, Hoppe’s position seems convincing. It sticks to the orthodox praxeological position stating that it is only strict preference that makes sense of a choice and seemingly does justice to indifference reducing it to a logical operator. Thus, indifference cannot result in choice. The person therefore cannot choose either between A and B or between C and D.

where 1) would be an unanalyzed version of Hoppean disjunctive-alternative interpretation, which, given 100 hundred units of butter, would read as follows:

1) Give up unit 1, xor unit 2, xor unit 3.... xor unit 100,

where indifference is accommodated into a series of logical operators of disjunctive alternatives. In other words, Hoppe is committed to saying that a vendor does not choose between those 100 units of butter at all. His choice is merely between giving up a unit or not, with the first option being strictly preferred and acted upon. Conspicuously then, the authors talk past each other as far as the notion of *choice* is concerned. My thesis is that Hoppe implicitly assumes that the opportunity set comprise psychologically and intensionally described end-states. This construal tallies smoothly with the Hoppean (2005, 2009) *correct description of an action*. After all, Hoppe is explicitly concerned with the mentalist aspect of an action, the mere behavioral underpinnings (of course assuming that the person was acting in the first place) being insufficient for the determination of what the actor strictly preferred. What my interpretation also explains is why Block (2009, p. 58) does not “give two hoots about whether or not we achieve a correct description of someone’s action.” I therefore posit that Block, when taken to his logical extremes, would have to admit that what was chosen was *all the details and peculiarities* of the state of affairs actually brought about by the actor. Basically, what sheds light on the scrutinized controversy is *action-type/action-token distinction*.² To sum up, Block and Hoppe could not settle the issue since Hoppe conceives of choice as operating in the set of psychologically defined action-tokens, whereas for Block, what was picked up (and hence also set

² Technically speaking, such unique physical instantiations of generically (intentionally) described action-types are referred to as *action-tokens* (See Steiner, 1994). Trivially, there can be infinitely many action-tokens subsumed under one action-type. For instance, going to a cinema (action-type) can be satisfied by numerous action-tokens (e.g. going to a cinema C by the route R at a specific time T). On the other hand, one and the same action-token can satisfy numerous action-types (or Hoppean correct descriptions of an action, with the proviso that the correct description of an action resides in the mind of an actor, whereas an action-type abstracts from all the peculiarities and contingencies of the action-tokens that satisfy it). For example, going to a cinema C by the route R at a specific time T may be an instance of strolling around, reaching a specific destination D that R is only a part of etc.

aside) are action-tokens (as defined extensionally³, e.g. by dint of Cartesian spatiotemporal coordinates).⁴

Now, what are the relative merits of Block's position over Hoppe's? First and foremost, Hoppe's account seems trivial. Once Hoppe has introduced the correct description of the action, action cannot say anything over and above Hoppe's descriptions. Hoppe starts with the *correctly* described value scale of an actor; so, when ultimately some action takes place, it is the former which is projected onto the latter. Therefore, the latter cannot elucidate the former in any way. The doctrine of demonstrated preference would now look redundant. What is worse, a value scale, which Hoppe would have to admit, exists *independently of and prior to* action, which plainly runs against Mises's (1998, pp. 94–96) construal of the relation between action and value scales.

The second indictment against Hoppe is that his theory resorts to psychologizing. If we take his correct description of the action seriously, we should start doing an exercise in psychology. For let us imagine, drawing on Hoppe's (2005) famous example of the mother trying to decide whether to save Peter or Paul who are both drowning, that the mother decides to save Peter *only because* she

³ An anonymous reviewer incisively hinted at the possibility that my account of action in terms of action-token might be behavioristically skewed, that is that I try to describe actions in purely physical terms. Rather, my attempt is to individuate action-tokens and to propose them as a domain of choice. Also, I would readily concede that behavior does not rank as action just yet. It takes a purpose for behavior to qualify as action. In other words, a behavior-token (to coin a word) qualifies as an action-token only when it is a purposeful behavior-token. My point is that whatever the purpose for our behavior-token is, that behavior-token constitutes an action-token. If our purposes therefore vary, the action-token instantiated in the unique spatiotemporal dimensions remains what it is: the same action-token. For example, the physically identical series of bodily movements might be motivated by our willingness to dance or to impress our friends, or to confuse them for that matter. Yet, as long as the movements are the same in spatiotemporal terms (while the reasons therefore vary), we would speak of the same action-token.

⁴ That is why we can validly say that it was this very unit of butter which was given up and thus valued least. The Hoppean intensional psychological account cannot make sense of why it was this (and not the other) unit of butter which was given up. In fact, Hoppe would basically say that this particular unit was not given up—numerical identity did not matter at all. What mattered is a qualitative identity, that is the fact that it was *a* unit of butter (See Block and Barnett, 2010, p. 11).

knew that it was only Peter who knew some secret information she was eager to find out. In other words, let us imagine that if neither of them had been trusted with a secret, she would have been genuinely indifferent between saving Peter or Paul or none. Now, in the actual fact, because the mother is aware that it is Peter who *is* trusted with the information she is striving to save, what she demonstrates by the act of saving Peter is that she prefers to save the information to not saving it. So what does this actual act of saving Peter demonstrate? Hoppe is (*ex hypothesi*, that is on the grounds of our assumed correct description of the mother's action) unable to say that she preferred to save Peter. He must say that she indeed preferred to save the information (willy-nilly, together with Peter) to not saving it. Therefore, this act does not demonstrate anything over and above what Hoppe already knows due to the correct description of the mother's action. In this case, praxeologists observing the mother's action from a third-person perspective would have no means to say what the mother preferred. They would have to either do reverse psychology or simply ask her about her motives only to determine her preferences. So the question arises: does *this sole particular reason* (that the mother in fact wanted to save the information) have a bearing on *what* the action demonstrates? No. What we apodictically know is that the mother strictly preferred the world in which Peter survives rather than Paul—for whatever reason. The last statement is simply *description-independent* and *a priori true* regardless of the actual motivation driving the mother to rescue Peter. Let us note, that if we understand choice as relating to action-tokens, the issue of motivations or correct descriptions of actions does not even emerge.

Finally, the Hoppean position may look a little clumsy when we realize that if we bear with Hoppe and admit that the mother was genuinely indifferent between Peter and Paul and in the actual fact she rescued Peter, we are linguistically paralyzed and we cannot say that she *chose* Peter. According to Hoppe, what we are only entitled to say is that she was indifferent between the two and what she *did choose* is to save one son instead of neither of them. Although this position is logically coherent, our linguistic intuition recoils at the thought of us being unable to say that the mother obviously *chose* Peter. Instead, action-token understanding of a choice would readily and triumphantly admit that the preference for rescuing Peter was exactly what the mother demonstrated because this

very state of affair in which Peter survives was brought about by her action, the reasons therefore being simply irrelevant, which is again the very part and parcel of praxeology.⁵

REFERENCES

- Block, Walter E. 2009. "Rejoinder to Hoppe on Indifference," *Quarterly Journal of Austrian Economics* 12, no. 1: 52–59.
- Block, Walter E. and William Barnett II. 2010. "Rejoinder to Hoppe on Indifference, Once Again," *Reason Papers* 32: 141–154.
- Hoppe, Hans-Hermann. 2005. "Must Austrians Embrace Indifference?" *Quarterly Journal of Austrian Economics* 8, no. 4: 87–91.
- . 2009. "Further Notes on Preference and Indifference: Rejoinder to Block," *Quarterly Journal of Austrian Economics* 12, no. 1: 60–64.
- Mises, Ludwig von. 1949. *Human Action. A Treatise on Economics*. Scholar's Edition. Auburn, Ala.: Ludwig von Mises Institute, 1998.
- Steiner, Hillel. 1994. *An Essay on Rights*. Oxford: Blackwell Publishers.
- Wysocki, Igor. 2016. "Indifference—in Defense of Orthodoxy," *Societas et Ius* 5: 15–30.

⁵ Somehow, paradoxically, it seems that the debate between the two authors was raging partly outside the realm of praxeology. After all, Hoppe's insistence on the correct description of an action transcends praxeology and, alas, enters psychology (See Wysocki, 2016).

FREEDOM, COUNTERFACTUALS AND ECONOMIC LAWS: FURTHER COMMENTS ON MACHAJ AND HÜLSMANN

MICHAËL BAUWENS

KEYWORDS: free choice, counterfactuals, economic laws

JEL CLASSIFICATION: B00, B40, B53

INTRODUCTION

In a series of articles written around the turn of the century, Guido Hülsmann has tried to answer one simple question: “How can we reconcile the idea that there are laws of human action, that manifest themselves in market prices and the structure of production, with the idea that there is also freedom of choice?” (Hülsmann, 2000, p. 48) He has addressed the question most extensively in his “Facts and Counterfactuals in Economic Law” (Hülsmann, 2003), but his distinctive approach is present in several other articles as well

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(Hülsmann, 1998, 1999, 2000, 2004). Moreover, the first explicit development of this insight is in Hülsmann (1999), in response to Caplan's elaborate critique of the Austrian methodology, thereby indicating how crucial the issue is to praxeology as an intellectual enterprise, and to that extent to Austrian economics. Mateusz Machaj has commented on the very core of Hülsmann's proposal (Machaj, 2012). As an epigraph, he chose a quote from Morpheus in *The Matrix*: "What happened, happened, and couldn't have happened any other way"—pun intended or not against Hülsmann's (metaphysical) libertarianism. This paper will briefly present Hülsmann's main claim, Machaj's comments, and offer a reply to those comments, further clarifying Hülsmann's point.

HÜLSMANN'S CLAIM

Hülsmann considers the essence of scientific explanation to give "a law-based account of facts in terms of other facts, so scientists search for and study laws that exist among the things observed in our world. A thing X is scientifically "explained" if we can show that there exists a constant (e.g., causal) relationship between X and another thing Y." (Hülsmann, 2003, p. 67) However, given the existence and nature of free human choice, no constant relationships seem to exist between a particular human choice or action, and, quite literally, anything else in the universe. There are no necessary constant relationships between anything a person does at a certain point in time, and anything preceding that choice in time—including all the past choices of that person—or anything in the world at that instant, including all facts about that person, that could explain the choice made. Sciences such as psychology, sociology, or first-hand acquaintance with a person can mitigate the strictness of that fact, but metaphysically it remains the case—unless one adopts some version of determinism. Economics, likewise, can mitigate the implications of (metaphysical) free choice by adopting some stylized 'homo oeconomicus' that works in most cases or is sufficiently useful for purposes of prediction and modelling. As Hülsmann puts it in his critique of neoclassical economics: "They want to analyze how people act as a corollary or sequel of given circumstances; that is, they want to explain human behavior in terms of other observable and introspectively knowable facts." (Hülsmann, 1999, p. 5) The significance of Hülsmann's

proposal is that it grounds the existence of economic laws precisely on the metaphysical irreducibility of free choice with alternative possibilities, instead of trying to mitigate its implications:

I will argue that the bulk of economic laws are based on relationships that are contained *within* choice. The visible part of a choice, the realised alternative, brings an observable fact into being, for example, a walk in a park. This fact stands in certain essential relationships to the *unrealised* alternatives of the same choice, for example, staying home to watch TV, staying home to eat ice cream, etc. These unrealised alternatives are the other side of choice, its invisible part. They have no actual existence for the very reason that they are unrealised alternatives." (Hülsmann 2003, p. 70, emphasis in original)

This proposal is a philosophical treasure trove—or hornet's nest—but the main implication for economic methodology would be that economics can therefore provide us with strict counterfactual laws that do not need a *ceteris paribus* (CP) clause. If the essential relationships discovered by economists are between facts *within* choice, it is unconditioned by what is or is not happening 'outside' the choice. Economists can therefore not merely predict what will happen *other things being equal*, but what will happen *regardless* of other things—but compared to counterfactual, unrealized possibilities. That is, the seemingly problematic metaphysical status of human choice, as being unrelated to anything outside of that choice, has become the very foundation for the epistemological robustness of economic laws.

MACHAJ'S COMMENTS

Machaj critically engaged the very core of Hülsmann's proposal (Machaj, 2012), ultimately defending a modified version of the *ceteris paribus* approach. He gives a stylized reconstruction of Hülsmann's argument by introducing a simplified equation for capital accumulation, for illustrative purposes only, whereby K stands for the amount of accumulated capital, T for the influence of taxation, and the letters A, B, C, D for other factors affecting the amount of capital:

$$K = f(A, B, C, D, T)$$

(Machaj, 2012, pp. 445–446)

In the CP approach as understood by Hülsmann and Machaj, assessing the influence of taxation on capital accumulation would look thus:

$$K\downarrow = f(A, B, C, D, T\uparrow)$$

(Machaj, 2012, p. 446)

That is, only if the other factors remain constant can we know that an increase in taxation will lead to a decrease in capital accumulation.

Machaj grants Hülsmann's basic point that we can weaken this strict *ceteris paribus* rule towards a counterfactual rule, because even with other factors (A, B, C, D) influencing K, we can still know that the increase in T led to a lower level of K than otherwise would have been the case. Hence, even if all the other factors contributed towards a higher level of K, and a higher level of K than in the previous period was indeed obtained, still the level would have been even higher without the increase in T. But here is his worry:

There are numerous *possible worlds* in the counterfactual ladder—which possible world does Hülsmann advise us to hide behind the phrase “otherwise would have been”? Certainly he cannot have in mind the whole set of all the possible worlds that could have existed. (Machaj, 2012, p. 448, emphasis in the original)

He makes this point more explicit with the capital accumulation equation used above, asking us first to consider a case where the other factors changed as well:

$$K = f(A\uparrow, B\downarrow, C\uparrow, D\uparrow, T\uparrow)$$

(Machaj, 2012, p. 448)

For such a case, the counterfactual law would be that the capital level is lower than in the counterfactual state of affairs in which taxation was not increased. But as Machaj points out, we simply do not know what that other scenario would have looked like—except for the level of taxation—so we do not know whether or not capital would have been higher. If we do not know what's behind the question marks, we do not know what happens:

$$K' = f(A?, B?, C?, D?, T)$$

(Machaj, 2012, p. 449)

Hence, he concludes:

The suggested answer would be that in the alternate scenario other factors have to change in the same way as in the actualized scenario of increased taxation: $K' = F(A\uparrow, B\downarrow, C\uparrow, D\uparrow, T)$ [...] Factors do not have to *stay the same*, but in counterfactual scenarios they have to *change in the same way as in the factual scenario*. That is why the counterfactual approach can be seen as a broader *ceteris paribus* assumption. (Machaj, 2012, p. 449, emphasis in the original)

To sum up, Machaj grants to Hülsmann that we can go beyond a strict CP rule claiming that economic laws only hold between different points in time where all other factors remain the same, but that Hülsmann's counterfactual approach only holds if we compare the factual scenario to a counterfactual scenario in which the other factors changed in the same way as in the factual scenario. That is, the CP rule still holds, but between two possible scenarios at one point in time (one with, one without a tax increase) instead of between two scenarios at different points in time.

A COMMENT ON MACHAJ'S COMMENT

However, Hülsmann's point is that the counterfactual law quite literally *does* apply to "the whole set of all the possible worlds that could have existed." It does not matter at all what is behind these question marks in the counterfactual case, and hence these counterfactual laws are indeed unconditioned by evolutions in these other factors. Hülsmann's point is precisely that no matter what one fills in for these question marks, in each and every counterfactual state of affairs, $K' > K$.

To continue on the toy-model, let

$(K_1, K_2, K_3, \dots, K_n)$

stand for all possible states of affairs where taxes were increased, with the four other variables varying in all possible ways. In each and every one of these cases, there is a corresponding scenario

$(K'_1, K'_2, K'_3, \dots, K'_n)$

in which taxes *would not have been* increased and where capital accumulation therefore *would have been* higher. Hence, no matter in which of the possible increased-taxation scenarios we end up, the counterfactual scenarios in which taxes would not have been increased are ones with a higher level of capital accumulation

$$(K'_1 > K_1, K'_2 > K_2, K'_3 > K_3, \dots, K'_n > K_n),$$

or:

$$\forall i \in \{1, 2, 3, \dots, n\} : K'_i > K_i$$

The CP rule still holds between any of these pairs, with the only changed variable being T , whereas all others remain constant. Hence, looking backwards in time, one can indeed point at the one factual scenario (e.g. K_3) and say that in the counterfactual case (K'_3), capital would have been higher.

However, when choosing for a higher level of taxation, it is not only not yet *known* in which scenario one is, it is strictly speaking not yet *settled*—it is still metaphysically ‘open’—which counterfactual scenario will obtain, given the countless free choices of other persons affecting the course of events. The validity of the law therefore does not depend upon that one CP pair of the factual and counterfactual scenario ($K'_3 > K_3$), but upon the entire range of possible scenarios for which ($K'_i > K_i$) holds *at the very moment of choosing*. The validity of the purported economic law holds regardless of—unconditioned by the fact—which scenario eventually obtains, and the case for Hülsmann’s strong claim still stands.

CONCLUSION

Hülsmann’s proposal is rife with philosophical assumptions, and implications for economic methodology. Carefully unpacking them all will require a lot more work and cooperation between economists and philosophers, but the stakes are high—both for praxeology and economics if they claim to be a science of (free) human action, and for philosophy for seeing how a *science of free* action is at all possible. After the stimulating challenge by Machaj, this paper offered a further contribution to clarify and strengthen that project.

REFERENCES

- Hülsmann, Jörg Guido. 1998. “Toward a General Theory of Error Cycles,” *Quarterly Journal of Austrian Economics* 1, no. 4: 1–23.
- . 1999. “Economic Science and Neoclassicism,” *Quarterly Journal of Austrian Economics* 2, no. 4: 3–20.

- . 2000. "A Realist Approach to Equilibrium Analysis," *Quarterly Journal of Austrian Economics* 3, no. 4: 3–51.
- . 2003. "Facts and Counterfactuals in Economic Law," *Journal of Libertarian Studies* 17, no. 1: 57–102.
- . 2004. "The a Priori Foundations of Property Economics," *Quarterly Journal of Austrian Economics* 7, no. 4: 41–68.
- Machaj, Mateusz. 2012. "In Counterfactuals We're All Dead," *Quarterly Journal of Austrian Economics* 15, no. 4: 443–455.

A COMPARISON OF INVESTMENT AND CASH BUILDING OF SAVINGS: A REJOINDER

ALEXANDRU PĂTRUȚI

ABSTRACT: Although Austrian literature does not usually dwell on this particular aspect, there are differences between the direct investment of savings and adding to one's personal cash balance (hoarding). Following Bagus's (2016) critic of my original article, the present paper will introduce supplementary qualifications. I will argue that in the course of ordinary business activity, there is no (plausible) reason why hoarding should imply disinvestment. Furthermore, I claim that the market rate of interest is the main indicator for entrepreneurs in a developed society which uses an advanced credit system. Finally, the paper will summarize the differences between investment and cash building and put these differences in connection to economic growth in order to see whether any of the two methods offers additional benefits.

KEYWORDS: Austrian school, market rate of interest, structure of production, investment, economic growth, hoarding

JEL CLASSIFICATION: B13, B53, E14, E22, E31, E41, E43, O40

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INTRODUCTION

In “*A Comparison of Direct Investment of Savings and Cash Building of Savings*” Philipp Bagus (2016) makes a thorough critique of my original article which attempted to analyze the intricate relation between hoarding, investment and economic growth. Interestingly enough, it appears that we generally agree regarding the *differences* between hoarding (or cash building, as Bagus [2016] prefers to call it) and investment, but we are at odds concerning the demonstration I employed in the original article, which was meant to show that investment would be more swift in promoting growth.

The original article (Pătruți, 2016) employed a Wicksellian framework that focused on the divergence between the natural rate of interest (NRI) and the market rate of interest (MRI) in order to point out the different effects of hoarding and respectively investment. This type of investigation is customary to the Austrian school, since it supplies the keystone for business cycle theory (Mises, 1998; Hayek, 2008). It is certainly not new, but it has not been applied, to my knowledge, to this specific issue in a coherent fashion.

The general claim I made was that the real movements in the structure of production could be affected by monetary frictions determined by individual hoarding. In this sense, directly investing the savings through the banking system would appear as a “preferable” alternative that could temper these short-term frictions.

In his reply to my original article, Bagus (2016) first raised a number of critical remarks regarding the two scenarios¹ I used and afterwards identified, correctly in my opinion, additional differences between the two phenomena. In the present paper I will first restate my thesis by incorporating as much as possible of the pertinent observations made by Bagus, in the belief that our differences are not as many as would originally appear. Secondly, I will attempt a rejoinder of the conclusions regarding the *differences* between hoarding and investment and *their effect on potential growth*.

¹ The two scenarios were hypothetical situations used to prove my main point in the original article (Pătruți, 2016).

THE CRITIQUE

The main observations raised by Bagus (2016) are, to my understanding, the following: that (1) *I overstressed the importance of the MRI*, that (2) *cash building by saving does not necessarily imply a longer time period* and that (3) *cash building does not necessarily stem from saving*. I will try to address all of them in an orderly fashion.

Restating the original analysis comprising the two scenarios would be superfluous, since I believe that generally Bagus should find it acceptable. The only critique I could find was that I was somewhat “*vague*” regarding the explanation of the real adjustment process of the structure of production in the second scenario (Bagus, 2016, p. 364). If this was the case, the only reason I had for that was brevity. I fully agree that the real processes of readjustment in the structure of production are the fundamental phenomena and that monetary processes are derivatives. I fully concede to his additions in this sense to my text. However, just claiming that “These spreads between buying and selling prices are the most fundamental phenomenon. The market rate of interest is just a derivative of this phenomenon” (Bagus, 2016, p. 365) does not solve the problem. It is clear that the natural rate of interest is the fundamental phenomenon, but entrepreneurs have no knowledge of this magnitude, which is more or less a theoretical concept. The signal they can use in practice is the market rate of interest. As Hayek (2008, p. 264) puts it:

But there is one medium through which the expected ultimate effect on relative prices should make itself felt immediately, and which, accordingly, should serve as a guide for the decisions of the individual entrepreneur: the rate of interest on the loan market.

This is the reason why I stress the importance of the market rate of interest (1), even though the pure rate of interest is the fundamental phenomenon. The belief that adjustment of relative prices in the structure of production is a slow and time consuming process is also documented by Hayek² (2008, p. 264):

² In my reading of the fragment I cited in the original article, Mises (1998, p. 542) holds the same opinion. It is true, as Bagus points out (2016, p. 368) that he refers

As the initial changes in relative prices which are caused by a change of the relative demand for consumers' goods and producers' goods give rise to a considerable shifting of goods to other stages of production, definite price relationships will only establish themselves after the movements of goods have been completed. For reasons which I shall consider in a moment, this process may take some time and involve temporary discrepancies between supply and demand.

This additional argument should suffice, in my opinion, to show why I stress the importance of the MRI and why it would be a faster tool in promoting growth. Would it be *impossible* for entrepreneurs to anticipate/speculate the change in cash balances? Of course not. As Bagus (2016, p. 368) claims:

Market participants can anticipate effects of cash building on prices and bid a negative price premium into the market rate of interest. Therefore, there is no necessary time lag. In the case of cash building through an increase in saving, the market rate of interest rate can fall immediately if the increase in purchasing power is correctly anticipated.

But to my understanding, this is nothing else than presuming perfect foresight on behalf of the entrepreneurs and, paraphrasing Keynes, "assuming our problems away."³ It is in this spirit that I claimed that hoarding "necessarily" involves a time lag (2).

Regarding the last comment raised by Bagus, respectively that hoarding does not necessarily stem from saving (3), it would probably be best to start by pointing towards two premises that I employed in the original scenarios, but which I probably failed to stress enough. My original analysis refers to a society in which there is a *smooth operating credit system* (banks, stock exchange) during *normal business activities*. A smooth operating credit system is the prerequisite of a developed economy, as Strigl (1934, p. 111) colorfully explains:

Clearly, the introduction of credit makes a significant increase in economic returns possible, because the interpersonal transfer of capital

to inflation. But one can find no reason why the price premium should always lag behind prices going up (inflation), but not behind prices going down (deflation).

³ Bagus (2016, p. 368) himself sees this problem and shortly adds a footnote to the paragraph stating "It is another question if the price premium is *likely* to be anticipated correctly."

will make it easier to direct capital into those usages in which its return—and consequently also the return from the other cooperating factors of production—will be greater. It is clear that only a smoothly operating credit market, or one operating with the least possible friction, will provide the prerequisite for “correctly” taking advantage of the supply of capital in the economy. Finally, it is also clear that a fully developed credit market is the prerequisite for the formation of a uniform interest rate, and that only a uniform interest rate makes the reliable calculation for the use of capital possible. Although we have said that credit is not a necessary prerequisite for an exchange economy using capital, we must qualify this here by adding that the institution of credit is certainly an adequate prerequisite for a relatively developed economy using roundabout methods of production.

Of course, I fully concede Bagus that if entrepreneurs would directly invest their savings, the MRI would be irrelevant. Credit would actually be irrelevant in that case. But such a society does not resemble our society at all. All I tried to show was that during normal business activity, in a society which uses an advanced credit market, the MRI could be a more efficient tool for entrepreneurs than waiting for the movements in relative prices to run their full course, due to an increase in the value of money.

I say ordinary business activity (and this relates to claim [3]), because the only examples that Bagus (2016, p. 363) can find in which hoarding implies *disinvestment*—i.e. it stems from investments—are *bank runs, looming wars, internal riots and natural disasters*.

Finally, there is only one more argument which I preferred to address last because, surprisingly, it does not have an economic nature but rather an ethical one. Bagus claims: “But who is to say what is optimal and what is not? From whose perspective is an action optimal?” I assume that I triggered this kind of reaction because if hoarding would be considered suboptimal, it would automatically result that the recommended policy program would be some sort of tax on cash holdings. Perhaps I did not stress enough that this was not my policy suggestion in the original article. I do not think that it would be useful or recommended to coerce people to put their money in the banks. I just consider that it would be advantageous for them to know that if they did (of course, considering that the banking system is healthy), they

would indirectly contribute to faster economic growth.⁴ Of course, if people desire economic growth, i.e. an increase in material prosperity, hoarding would not be optimal. If the “uncertainty avoidance,”⁵ as Bagus puts it, caused when keeping cash around is greater than the desire for potentially faster growth, hoarding becomes the optimal solution. But considering that individuals usually want to increase the quantity of consumer goods that they own, investing through the credit system would probably bring these goods faster to their doors.

A REJOINDER REGARDING THE DIFFERENCES BETWEEN HOARDING AND INVESTMENT

In the previous section, I included additional qualifications to my thesis in the attempt to clear away most of the problems raised by the systematic critique made by Bagus (2016). In this second part I am left with the relatively easy part of summarizing the differences between hoarding and investment, an area in which Bagus actually brought more detailed contributions than myself.

First, hoarding implies a (monetary) tendency of prices to fall and implicitly generates Cantillon effects, as Bagus (2016, p. 370) points out. The positive feedback loop which he mentions, i.e. the fact that deflation encourages hoarding and that hoarding generates deflation, is a compelling argument. If this were the case, negative effects such as the redistribution of wealth associated with changes in purchasing power would be unavoidable.

Second, there is an additional selection process regarding which entrepreneurs will benefit from the credit pool. I am indebted to Bagus (2016) for pointing out this effect. Specialized intermediaries such as banks do tend to spend time and effort in choosing good

⁴ In fact, my original article was named “An Analysis on the Relationship between Hoarding, Investment and *Economic Growth*.” Naturally, I would analyze how these magnitudes would affect *growth*. In his reply, Bagus (2016) eliminated the idea of growth and made the title “A Comparison of Direct Investment of Savings and Cash Building of Savings.”

⁵ The idea of treating money as a means of assuring oneself against uncertainty does raise some rather peculiar conclusions that I have previously discussed in a book (Pătruți, 2016) which unfortunately was not translated into English.

entrepreneurs, as opposed to the case of hoarding in which the increase in purchasing power indiscriminately benefits all entrepreneurs, good and bad.⁶

Third on the list is what I referred to as the “wholesaler” argument, i.e. the fact that the pooling of resources can direct huge amounts of credit to specific large scale investments which could not be available by direct investment. This is, to my mind, an argument distinct from the one above.

The fact that investment can foster a more stable structure of production than hoarding is a *fourth* difference. I was not aware of this argument, based on the theory of maturity mismatching (Bagus and Howden, 2010), in my original article. The idea is, if I understand correctly, that savers committed to long term projects give entrepreneurs an increased assurance for undertaking longer production processes. The longer the maturity of the deposit, the safer it is for businessmen to invest, because it is less likely that the saver will withdraw his money. Cash holdings, on the other hand, have zero maturity and the owner can instantly change his mind and consume the saved resources.

Finally, keeping in mind the additional qualifications I added to the original thesis, I still hold to the idea that investment would generate faster economic growth as compared to building up cash holdings. If the market is an evolutionary (and implicitly time-consuming) process through which entrepreneurs learn by trial and error which investment projects best serve consumer preferences, a swift adjustment of the market interest rate should help them in their endeavors, given that they do not possess full knowledge. In fact, all the above arguments produced by Bagus, i.e. the tamping down of the Cantillon effects, the additional selection process and the fact that we get a more stable structure of production, all add to the idea of optimality.⁷

⁶ This is indeed a much better formulation of my original argument of the benefits of an organized market (Pătruți, 2016, p. 263).

⁷ If we consider that the goal of the population is economic growth and not uncertainty avoidance or something else.

REFERENCES

- Bagus, Philipp and Howden, David. 2010. "The Term Structure of Savings, the Yield Curve, and Maturity Mismatching," *Quarterly Journal of Austrian Economics* 13, no. 3: 64–85.
- Bagus, Philipp, "A Comparison of Direct Investment of Savings and Cash Building of Savings: A Response to Alexandru Pătruți," *Quarterly Journal of Austrian Economics* 19, no. 4: 359–375.
- Hayek, Friedrich, A. von. 2008. *Prices and Production and Other Works*. Auburn: Ala.: Ludwig von Mises Institute.
- Mises, Ludwig von. 1998. *Human Action: A Treatise on Economics, Scholar's Edition*. Auburn: Ala.: Ludwig von Mises Institute.
- Pătruți, Alexandru. 2016. "An Analysis on the Relationship between Hoarding, Investment, and Economic Growth," *Quarterly Journal of Austrian Economics* 19, no. 3: 248–266.
- . 2016. *Teoria Structurii de Producție*. Iași, Romania: Alexandru Ioan Cuza University Press.
- Strigl, Richard von. 2000. *Capital and Production*. Auburn: Ala.: Ludwig von Mises Institute.

BOOK REVIEW

SCANDINAVIAN UNEXCEPTIONALISM: CULTURE, MARKETS, AND THE FAILURE OF THIRD-WAY SOCIALISM

NIMA SANANDAJI

LONDON: INSTITUTE FOR ECONOMIC AFFAIRS, 2015, 132 PP.

PER L. BYLUND

The Scandinavian countries, and primary among them Sweden, are commonly referred to as anomalies or inspirations, depending on one's political point of view. The reason is that the countries do not appear to fit the general pattern: they are enormously successful whereas they "shouldn't" be. Indeed, Scandinavians enjoy very high living standards despite having very large, progressive welfare states for which they pay the world's highest taxes.

As a result, a large and growing literature, both propagandist and scholarly, has emerged that tries to identify the reasons for this Scandinavian exceptionalism—especially as pertains to their

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welfare states. I have myself contributed to this literature (e.g., Bylund, 2010) and have previously reviewed others' contributions to it in this journal (Bylund, 2015). But what has been missing is a summary analysis that is accessible to non-scholars. It was therefore a delight to read Nima Sanandaji's *Scandinavian Unexceptionalism: Culture, Markets, and the Failure of Third-Way Socialism*, published by British Institute for Economic Affairs.

Dr. Sanandaji is a political-economy analyst and writer, well known in both Sweden and Europe, and as expected does an excellent job summarizing the state of scholarship. He also uses examples and quotes from articles published in Scandinavian news media to illustrate the narrative. The result is a short and informative but easy to read answer to both how and why the Scandinavian welfare states seem to work so well.

The short book provides the reader with insight into Scandinavian culture, an explanation of the causes of the nations' exceptional rise from poverty, an overview of their recent political-economic history, the distinct structure and evolution of the Scandinavian welfare state, the origins of their egalitarianism and gender equality, and the effect of immigration. I will briefly touch on three of these areas.

First, Sanandaji makes clear that the rosy story of the Scandinavian welfare state, as it is usually told, is at best incomplete. The Scandinavian countries were among the European continent's poorest by the end of the 19th century and were largely unaffected by the industrialization that had started centuries earlier in the United Kingdom. A combination of classical liberal reform and the adoption of industrialized production created a century-long "golden age," as Bergh (2014) denotes the period approximately 1870–1970 in Sweden, of economic growth and rapidly rising standards of living.

This growth was partly also made possible by a distinct Scandinavian culture, with is characterized by the "[h]igh levels of trust, a strong work ethic and social cohesion [that] are the perfect starting point for successful economies" (p. 7). As Sanandaji points out, the market-aligned virtues of Scandinavian culture also explain the limited impact of the welfare state as it was erected and ballooned in the 1930s and beyond. Cultural change takes time, and thus old values lag in the face of political change. So it took time for the Scandinavian virtues to give way to the destructive incentives of the welfare state.

It should also be noted, though Sanandaji fails to make this point clearly, that after the welfare state was established, and during its several decades of expansion, its growth rate tended to be lower than that of the overall economy. The increasing burden was therefore, in relative terms, marginal. That is, until the radical 1960s and 1970s when Scandinavian governments, and the Swedish government in particular, adopted very expansionist welfare policies. (This political shift is analyzed in detail in, e.g., Bergh [2014]).

Sanandaji also presents interesting data with respect to Scandinavian gender equality. His discussion begins with the internationally enviable women's labor market participation rate in Scandinavian countries, and especially Sweden. The background, however, is that Sweden's government had adopted a radical agenda for population control formulated by Gunnar and Alva Myrdal (yes, the same Gunnar Myrdal who shared the 1974 economics prize with Hayek). The gist of this reform was to enforce a shared responsibility between parents and "the community" for children's upbringing. By raising taxes on income while offering government-run daycare services, families were incentivized (if not "forced," economically speaking) to secure two full-time incomes.

Interestingly, while this indeed rapidly increased women's participation in the labor market, Sanandaji notes that "few women in the Nordic nations reach the position of business leaders, and even fewer manage to climb to the very top positions of directors and chief executives" (p. 102). Part of the reason is that jobs that women typically choose, including education and healthcare, are monopolized in the vast public sectors. As a result, women are trapped in careers where employers do not compete for their competence and many leadership positions are political.

This development is indirectly illustrated in a terrifying statistic from Sweden's labor market: "Between 1950 and 2000, the Swedish population grew from seven to almost nine million. But astonishingly the net job creation in the private sector was close to zero" (p. 33).

Finally, Sanandaji addresses the issue of immigration and shows that the Scandinavian nations were exceptionally good at integration, with greater labor participation for immigrants than other Western nations, prior to the radicalization of the welfare state. Thereafter,

due to rigid labor regulations and vast welfare benefits, immigrants were more or less kept out of Scandinavian job markets.

The literature identifies two potential explanations. First, the anti-business and job-protection policies practically exclude anyone with lacking work experience, highly sought-after skills, or those with lacking proficiency in the language or limited network. This keeps immigrants as well as young people unemployed (the very high youth unemployment rates in Scandinavia illustrate this problem). Second, the promises of the universal welfare state tend to attract people who are less interested in working their way to the top and thus have a lacking work ethic.

This explains the recent problems in Scandinavia with respect to immigration, which is essentially an integration and policy problem—not a foreign-people problem.

Overall, Sanandaji's book provides plenty of insights and a coherent explanation for the rise of the Scandinavian nations and their welfare states. Their impressive standard of living is a free-market story, which is rooted in an economically sound culture. This culture also supported the welfare state, until decades of destructive incentives eroded the nations' sound values. The welfare state, after its radicalization, was soon crushed under its own weight, and Scandinavia has since undergone vast free-market reforms that again have contributed to economic growth and prosperity.

Considering the full story, Sanandaji summarizes the example of the Northern European welfare states simply and bluntly: "Scandinavia is entirely unexceptional" (p. 10).

REFERENCES

- Bergh, Andreas. 2014. *Sweden and the Revival of the Capitalist Welfare State*. Cheltenham, U.K.: Edward Elgar.
- Bylund, Per L. 2010. "The Modern Welfare State: Leading the Way on the Road to Serfdom." In Thomas E. Woods, ed., *Back on the Road to Serfdom: The Resurgence of Statism*. Wilmington, Del.: ISI Books.
- . 2015. "Book Review: *Sweden and the Revival of the Capitalist Welfare State* by Andreas Bergh," *Quarterly Journal of Austrian Economics* 18, no. 1: 75–81.

BOOK REVIEW

PUBLIC POLICY, PRODUCTIVE AND UNPRODUCTIVE ENTREPRENEURSHIP: THE IMPACT OF PUBLIC POLICY ON ENTREPRENEURIAL OUTCOMES

GREGORY M. RANDOLPH, MICHAEL T. TASTO, AND ROBERT F. SALVINO JR. (EDS.)
CHELTENHAM, U.K.: EDWARD ELGAR, 2017, 176 PP.

PER L. BYLUND

Entrepreneurship is a double-edged sword. On the one hand, it has become almost universally recognized over the past few decades that entrepreneurship is the engine of economic change, the generator of economic growth, and the main cause of job creation. Consequently, policy is often used in different ways to support entrepreneurs to thereby create benefits from the positive effects of entrepreneurship.

On the other hand, as William Baumol (1990) famously identified, the outcome of entrepreneurship is not necessarily productive

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and a boon to the economy. Rather, entrepreneurship can be both productive and unproductive—and even destructive—depending on the institutional framework in which it takes place. Where the institutional “rules of the game” (North, 1990) can themselves be exploited for profit, entrepreneurs find themselves in a zero-sum game competing for the privileged position without producing value for consumers. Similarly, the framework for entrepreneurial action can be a source of uncertainty that harms the functioning of the market process (Bylund and McCaffrey, 2017).

Using policy to support entrepreneurship, therefore, is a balancing act between helping facilitate productive entrepreneurship while avoiding incentives that lead to unproductive behavior.

The recently published collection of essays *Public Policy, Productive and Unproductive Entrepreneurship: The Impact of Public Policy on Entrepreneurial Outcomes* aims to shed light on how public policy impacts entrepreneurial outcomes. The underlying yet implied question, with obvious policy implications, is this: under what circumstances does entrepreneurship contribute to raising our standard of living? To use Russell S. Sobel’s words from the foreword, the book’s eight essays “highlight both the potential and actual negative consequences of policies that encourage unproductive entrepreneurship” (pp. xii–xiii).

In the first essay (chapter 2) following the editors’ introduction, Joshua C. Hall, Robert A. Lawson, and Saurav Roychoudhury argue that economic freedom is critical to create an “entrepreneurial environment,” that is, an economic culture within which entrepreneurship thrives. Relying on insights from the *Economic Freedom of the World* reports, the authors demonstrate that economic freedom is empirically correlated with many measures of entrepreneurship. And, consequently, they conclude asking “would it not be prudent to at least consider eliminating the various government policies that stifle [entrepreneurship]?” (p. 7)

The second essay, by Pavel A. Yakovlev and Saurav Roychoudhury, analyzes the effect of specific types of regulatory burdens on business of varying sizes. They also argue that there is a link between migration and entrepreneurship, as both involve risk taking, and thus that countries that offer an institutional environment that facilitates entrepreneurship can benefit from both domestic and immigrant entrepreneurs.

The book's third essay looks at the relationship between regulation and entrepreneurship from the point of view of the regulator. The authors, James Fetzner and Gregory M. Randolph, provide an overview of challenges that regulators face due to the nature of the political process with respect to the design, implementation, updating and reforming of regulations.

Chapter 5 studies committee-based efforts in the United States Congress intended to increase entrepreneurship by supporting small business growth. The real effect, however, as revealed by the studied data, is that states represented on these committees experience *lower* levels of entrepreneurship. The author Matt E. Ryan concludes the chapter by noting that this suggests that "more politics leads to less entrepreneurship" (p. 76)—even though the intended effect is the exact opposite.

In chapter 6, Michael T. Tasto looks at how state spending on firm recruitment and economic development programs affect employment and find a positive relationship. States that do not spend on similar programs consequently lose and may thus be compelled to create such programs while other states increase their spending to stay ahead in a "race to the bottom." Also, the author argues, such state-level spending can be taken advantage of by entrepreneurs engaging in unproductive or destructive behavior to capitalize on the offered subsidies.

The next essay is a transcript of Peter G. Klein's testimony before the US House Committee on Financial Services in May 2012. Klein analyzes the Federal Reserve from the point of view of organizational economic theory offering a "reasonable, pragmatic, realistic view" (p. 108) of the central bank. The essay thus focuses on a specific institution and its implications for entrepreneurs, finding it both inefficient and ineffective.

The second to last essay introduces morality and human nature in the analysis of regulations. Authors Robert F. Salvino Jr. and Michael Latta argue that "Morality and economic actions may converge, but for this to be so over the long-run, the actions and their desired outcomes cannot violate human nature" (p. 111). They find that individuals need to be free to engage in economic actions to thereby "express and defend his or her moral purpose." This applies to policy as well, as policy designed without regard for economic and moral costs disrupts rather than supports entrepreneurship.

In the final chapter, Gregory M. Randolph and Marek Rivero discuss informal institutions and entrepreneurship. The development and evolution of informal institutions remains understudied in the literature and these processes are thus poorly understood, which is problematic for policy making. The chapter discusses the definition, measurement, and analysis of informal institutions, and what this means for policy.

Overall, the book offers little that would surprise Austrians or economists used to public choice analysis. The chapters elaborate on and analyze the measurable burden of regulation on entrepreneurship using various types of data, but do not venture far from the near-obvious (to praxeologists) unintended consequences of policy or inefficiency of policy-induced reallocation of resources. The chapters also do not make any theoretical contributions regarding how entrepreneurship and policy are (inter)related.

But this is not the purpose of the book and should therefore not be considered a major weakness.

This collection of essays is best described as a primer on the topic indicated in the book's subtitle: the impact of public policy on entrepreneurial outcomes. Each of the eight essays targets a specific aspect of policy effects on entrepreneurship, and they each contribute in their own way to the common conclusion that entrepreneurship is a double-edged sword that can be both productive and unproductive—depending on the institutional rules of the game. And they paint a broad yet consistent picture that should be of great help to those familiarizing themselves with the study of entrepreneurship and policy.

REFERENCES

- Baumol, William J. 1990. "Entrepreneurship: Productive, Unproductive, and Destructive," *Journal of Political Economy* 98, no. 5: 893–919.
- Bylund, Per L., and Matthew McCaffrey. 2017. "A Theory of Entrepreneurship and Institutional Uncertainty," *Journal of Business Venturing* 32, no. 5: 461–475.
- North, Douglass C. 1990. *Institutions, Institutional Change and Economic Performance*. Cambridge: Cambridge University Press.

BOOK REVIEW

THE CAPTURED ECONOMY: HOW THE POWERFUL ENRICH THEMSELVES, SLOW ECONOMIC GROWTH, AND INCREASE INEQUALITY

BRINK LINDSEY AND STEVEN M. TELES

OXFORD: OXFORD UNIVERSITY PRESS, 2017, VIII + 221 PP.

DAVID GORDON

D uring the late nineteenth and early twentieth centuries, the Progressives claimed that the American political system was corrupt. Large financial and business interests dominated the government. What should be done to end their noxious influence and to promote the public good? Guidance from intellectuals, not wheeling and dealing by corrupt politicians, should set the political agenda. Nonpartisan scientific experts should take over much of the day-to-day work of government.

In his definitive *The Progressive Era* (2017), Murray Rothbard had little use for these would be intellectual autocrats: Behind

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the Progressive program were “newly burgeoning groups of intellectuals, technocrats, and professionals: economists, writers, engineers, planners, physicians, etc., anxious for power and lucrative employment at the hands of the State.” (p. 37)

Brink Lindsey is by his own lights, though not by mine, a libertarian; and Steven Teles is a modern liberal. They have together devised a new “libertarian” outlook. (The word combines elements of “libertarian” and “egalitarian”) It is a new name for an old way of thinking, and students of the Progressives will find little to surprise them.

Experts, the authors tell us, must be in charge:

Making Congress more deliberative, and less subject to undue influence, is a matter of making it smarter and more independent of the interests trying to bend it to their will. The way to do that... is to finally bring the civil service system to Congress.... The first best option would be to reconstruct committee staff on the model of the Congressional Budget Office and the Government Accountability Office, which provide stable long-term employment to highly trained policy experts in a context of strict non-partisanship. (pp. 161–162)

The Federal Trade Commission should extend its expert guidance to the states:

If an anti-rent organization in a state can generate enough energy to request the FTC to issue an advisory opinion, it can introduce a very powerful, authoritative counterweight into a normally insulated decision-making process. The FTC could be doing even more in this area by providing more resources to pay for research and participate in state deliberations. (p. 166) (The authors usually mean by “rent” an artificially created scarcity.)

The authors worry that these suggestions do not go far enough. Perhaps the power of Congress should be reduced and that of the president—of course guided by expert intellectuals—increased:

We should at least consider the possibility that Congress, and legislatures in general, is unavoidably tilted toward upward redistribution.... [William] Howell and [Terry] Moe suggest that the best way to counter Congress’s rent-friendly provincialism is to require Congress to give an up-or-down vote to legislation proposed by the president.... This admittedly dramatic procedural reform would give presidents much

more power to shape the policy alternatives considered by Congress.
(pp. 169–170)

Contrary to what I have claimed, though, are the Progressives and our self-styled libertarians really that similar? Libertarianism—in however attenuated a form—and Progressivism are after all two very different ideas. But finding the difference in this instance proves elusive.

The influence of special interest groups on legislation, highlighted by the authors, is indeed a serious problem; and the natural libertarian response would call for the power of the state to be curtailed, if not done away with altogether.

Conservatives and libertarians have failed by insisting that the baby be thrown out with the bath water. Once government assumes any responsibility to regulate in a given area, they argue, it is inevitable that rent-seeking will corrupt policy-making. Accordingly, the only way to solve the problem is to dramatically shrink the scope of the state.... This is a dead end. The modern regulatory and welfare state isn't going anywhere, and the reason is simple: the vast majority of Americans, conservatives and liberals alike, think it's a good idea. Although one of us wishes it were otherwise, there is no significant political support for a dramatic rollback of government's functions. (p. 10).

Lindsey is the one who “wishes it were otherwise,” but he too supports the welfare state. Here the authors ally with the Progressives, not libertarians. They do not propose to reduce the scope of the state.

The authors rightly decry government programs that bring about “upward redistribution” of money to well-off special interests. But so did the Progressives; there is nothing distinctively libertarian about it. The libertarian objection is to redistribution, not just “upward” redistribution; libertarians do not object to inequality in itself. Lindsey and Teles clearly position themselves in the egalitarian camp; you will find nothing in the book opposing downward redistribution. They begin by bemoaning “the rise of income and wealth inequality, driven especially by rapid gains at the top.” (p. 1) In doing so, they accept without question the dubious statistics of Thomas Piketty. They do not so much as mention any of the criticisms of Piketty by Philip Magness, Robert

Murphy, and others. Our liberalitarian authors would do well to acquaint themselves with the compilation *Anti-Piketty*. (Delsol et al., 2017). To their credit, though, they reject Piketty's claim that "there is a fundamental tendency in capitalism toward ever-greater concentration of wealth" (p. 123).

They do not wish to replace capitalism but rather to curtail government programs that benefit the well-off. Here they make a real contribution, and the individual chapters on the programs they question are far better than the overall framework of the book. They note, for example, that "the government's efforts to reduce the harm caused when financial firms fail ends up subsidizing the heavy reliance on debt that makes firm failure more likely. . . It is no surprise, then, that the creation of a formal safety net for banks led to a higher level of indebtedness. In addition to these explicit subsidies, an implicit subsidy created by a string of ad hoc bailouts has further incentivized financial institutions to ramp up their leverage." (p. 52)

They next turn to intellectual property and find little good in it.

Notwithstanding the flimsy evidence that intellectual property laws actually fulfill their constitutional mandate "to promote progress in science and the useful arts," these laws have steadily expanded their scope and reach over the years, with explosive growth occurring during the past few decades. The combined effect of those recent expansions has been to throw sand in the wheels of the sectors of the economy with the greatest potential for growth and innovation. (p. 75)

In their discussion of this topic, they fall prey to a common error, though this fortunately leaves their analysis unscathed. After their discussion of the deleterious consequences of IP, they say,

[I]ntellectual property protection is not justified solely on utilitarian grounds, any more than freedom of religion or speech are. The expansion of intellectual property protection has been justified because, like these other rights, its advocates could make a moral claim on its behalf. (p. 84)

The contrast between "utilitarian" and "moral" is spurious; good and bad consequences are part of morality, if not, as many believe, the whole of it.

Occupational licensing, the authors point out, hurts the poor.

Licensing has well-hidden negative impacts on the economically less advantaged, increasing the prices they pay for services, closing them out entirely from whole sectors of the economy, and increasing the costs they pay to move up economically. (p. 108)

Zoning fares no better in their eyes.

The overriding purpose of land-use regulation has been to protect homeowners' property values at the expense of housing for everybody else. In other words, zoning exists to transfer wealth from new buyers to existing owners.

The book on the whole is written clearly, but disaster has struck between pages 132 and 140. Solecisms abound on these pages: the authors misuse the words "enervated," "disinterest" and "reticent."

The Captured Economy contains valuable accounts of a number of harmful government programs. The attempt to construct a watered-down libertarianism that will attract the left, though, fails completely.

REFERENCES

- Delsol, Jean-Philippe, Nicolas Lecaussin, and Emmanuel Martin, eds. 2017. *Anti-Piketty: Capital for the 21st Century*. Washington, D.C.: Cato Institute.
- Rothbard, Murray N. 2017. *The Progressive Era*. Patrick Newman, ed. Auburn, Ala.: Mises Institute.

BOOK REVIEW

ANTI-PIKETTY: CAPITAL FOR THE 21ST CENTURY

JEAN-PHILIPPE DELSOL, NICHOLAS LECAUSSIN, AND EMMANUEL MARTIN, Eds.
WASHINGTON, D.C.: CATO INSTITUTE, 2017, xxvii + 272 pp.

DAVID GORDON

When Thomas Piketty's *Capital in the 21st Century* was published in 2014 (the French edition had appeared the preceding year), it suffered an unexpected fate for a treatise of 700 pages, filled with statistics and equations. It became a best-seller. Proclaimed a masterpiece by Paul Krugman and worthy of a Nobel Prize for its author by Larry Summers, it perfectly encapsulated and extended a familiar narrative of anti-capitalist propaganda, found in cruder form in the speeches of Bernie Sanders.

According to Piketty, capitalism over time widens the gap between the rich and the poor. In recent years, complaints have abounded that only the rich, and especially the superrich, gain from economic growth. In Piketty's view, this fact is no happenstance of present conditions but reflects a law of capitalist

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development. This law is the famous $r > g$, i.e., the rate of return on capital exceeds the rate of economic growth. Capitalists who get interest payments will take over a greater and greater share of the gains from economic growth, and the gap between rich and poor will widen. At times this distressing trend can be halted; wars and revolutions slow capital accumulation and increase equality. But the overall trend toward inequality is clear and needs to be contained by high taxes on income and wealth.

Piketty's portrayal of capitalism has not gone unchallenged, and *Anti-Piketty* collects a number of the most important criticisms of it. One of the most telling of these criticisms is obvious. If capitalism has been so bad for the poor, how can it be that the standard of living for the poor has vastly increased? As Jean-Philippe Delsol, a French economic journalist, notes,

People who focus on inequality often seem to forget a historical fact: market economies have allowed a great many people to get rich and to get out of poverty. This effect is unprecedented in history.... The speed at which the market economy allows sections of humanity to get us out of poverty should make us marvel. (pp. 5–7)

The well-known demographer and economist Nicholas Eberstadt makes a related point.

Whatever may be said about economic inequalities in our epoch, material forces are quite obviously *not* working relentlessly and universally to increase differences in living standards across humanity today. From the standpoint of length of life and years of education, indeed, the human condition is incontestably more equal today than it has ever been before. (p. 27)

How might Piketty respond? It is apparent from his book that what concerns him is the gap between rich and poor, more than the quality of life enjoyed by the poor. He would be likely to say, "Granted that the poor today do not for the most part live in abject circumstances. Still, the superrich have enormously more wealth than anyone else. That by itself suffices to justify corrective action by the government."

But this would open Piketty to a further objection. Why is inequality bad? If you lead a good life but others are much better

off, why do you have any cause for complaint, just because of the inequality? That is a fundamental question, but unfortunately it is not addressed in *Anti-Piketty*. In a densely written essay, Daron Acemoglu and James A. Robinson say, "It may be difficult to maintain political institutions that create a dispersed distribution of political power for a wide cross section of people in a society in which a small number of families and individuals have become disproportionately rich." (p. 174)

Taking their comment on its own terms, would not a better solution to the problem it poses be to reduce the power of the state rather than to confiscate wealth? But this is not the issue I wish now to address. This is the failure of the contributors to address the intrinsic justice of equality. Is equality good or bad in itself? Why or why not? The contributors leave this vital issue to the side.

Before we can deal with whether Piketty's $r > g$ accounts for rising inequality, we must ask another question. Has he shown that inequality is in fact rising? If it is not, there is nothing for his formula to explain.

The historian Phillip W. Magness and the economist Robert P. Murphy in a joint paper analyze to devastating effect Piketty's statistical evidence for inequality. They come close to charging Piketty with fraud and deception:

The discrepancies we identify are pervasive in the book, beginning with misstatements of basic historical fact and extending to an abundance of political distortion and confirmation bias in his data selection and methodological choices. In his use of communist data assumptions to accentuate the shape of a desired trend line, ostensibly explaining a hypothesized characteristic of capitalism, for example, it is difficult to maintain a noble opinion of the scholarship involved. (p. 138)

Piketty's signature tune, the $r > g$ formula, fares no better at the hands of the contributors to this book. The economist Randall Holcombe uses a point much stressed by Austrian economists to dismember Piketty's entire approach to capital theory. Piketty writes as if the return to capital were automatic: all a capitalist needs to do is invest his money and rewards will flow to him at a fixed rate. Precisely the opposite is the case:

The general idea—that capital does not just earn a rate of return, but has to be employed in productive activity by its owner—plays no role in the way Piketty analyzes his extensive data set on inequality. Piketty makes it appear that earning a return on capital is a passive activity.... But capital has value only because it provides a flow of income to its owners, and it only provides that flow if the owners employ it productively. (p. 209)

Piketty misconceives the nature of economic growth. He bemoans the gains of capitalists, but without their investments growth would not take place. He follows a famous model of Robert Solow, in which changes in technology, not additions to capital, are the primary drivers of growth. But as Mises long ago noted, knowledge of technology in poor countries far exceeds the ability of these countries to put this knowledge into practice. What these countries need is more capital; and if economic growth is to continue in well-off countries, they need increases in investment also. Piketty's confiscatory policies would choke off growth and prosperity in the name of equality. (This basic point against Piketty has been made most effectively in a short book not included in this collection, George Reisman's *Piketty's Capital* [2014].)

Does Piketty have a response? He might claim that even if capitalist investment does promote economic growth, the capitalists will seize the benefits for themselves, leaving others no better off. The economist Hans-Werner Sinn shows the error of this line of thought:

[Piketty's] formula does not imply that wealth grows faster than economic output. Such a conclusion would only be warranted if the savings of an economy could be set equal to the economy's capital income, so the rate of economic growth is the same as the interest rate. But this is not the case. Rather, savings are consistently smaller than the sum of all capital income. The wealthy consume substantial parts of their income.... Thus, the growth rate of wealth lies significantly below the interest rate; the fact that the interest rate exceeds the rate of economic growth in no way implies that wealth grows faster than the economy. (pp. 215–216)

So much for $r > g$.

Suppose, though, that one accepted Piketty's analysis and was accordingly concerned with capitalists' having too much. As Michael Tanner aptly remarks, Piketty's solution to this alleged problem would not work. "He seems to believe that 'confiscatory taxes' (his term) can be imposed without changing incentives or

discouraging innovation and wealth creation. Piketty's solutions would undoubtedly yield a more equal society, but also a remarkably poorer society." (p. 58) Instead, Tanner suggests, why not encourage the emergence of more capitalists by making Social Security private? "No policy proposed in recent years would have done more to expand capital ownership than allowing younger workers to invest a portion of their Social Security taxes through personal accounts." (p. 59) Piketty has no use for pro-market proposals of this sort.

The essays in *Anti-Piketty* make Nicolas Lecaussin's claim incapable. Piketty is one of those "intellectuals" who, as Ludwig von Mises and Robert Nozick have noted, resent the free market because "it does not recognize them at---what they think is---their 'fair value.'" (p. 48) Readers of this book will be inoculated against Piketty's ill-considered analysis and policies.

REFERENCES

- Piketty, Thomas. 2014. *Capital in the Twenty-First Century*. Arthur Goldhammer, trans. Cambridge: Harvard University Press.
- Reisman, George. 2014. *Piketty's Capital*. Laguna Hills, Calif.: TJS Books.