

Monetary Misperception, Rational Expectations, and the Austrian Theory of the Business Cycle

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Abstract

Salter and Luther (2016) argue that Austrian business cycle theory can be interpreted as one where consumers and entrepreneurs with rational expectations make erroneous investment decisions driven by misperceptions regarding real vs. nominal shocks. Although we are sympathetic to their individual points, in this paper we criticize their overall stance on two grounds. First, we argue that their Lucasian approach to the boom treats money as a mere veil, ignoring the “driving force of money” that Mises emphasized. Second, we criticize their analysis of the bust on the grounds that their model lacks a capital structure. Although their discussion of the intertemporal production possibilities frontier is arguably an improvement on Garrison’s treatment, we argue that by neglecting the time structure of production, their model is unable to generate a bust similar to that put forth by the traditional ABCT that involves a significant reallocation of resources and that leaves the economy permanently poorer.

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I. Introduction

Salter and Luther (2016) argue that they can recast the traditional Austrian business cycle theory (ABCT) within a theoretical framework where agents maintain rational expectations during the boom period and where equilibrium always prevails during the bust. In this respect, they build on the pioneering work of Robert Lucas (1972, 1973, 1975) to meet the standard “rational expectations” objection to traditional ABCT, as well as to render ABCT more palatable to neoclassical colleagues.

Specifically, in Salter and Luther's treatment, the boom commences when a monetary shock misleads agents into making inappropriate investment decisions, which moves the economy *along* (not beyond, as in Garrison [2001]) the three-dimensional production possibilities frontier (PPF) to an unsustainable point. This mistake by the model's agents is rational once we account for the information constraints they face. However, in the following period, the mix of feasible consumption and investment outputs has contracted (due to the mistaken output mix in the boom period), such that plans must be revised and resources must be reallocated in a costly manner, causing the standard of living to fall—all within an equilibrium framework.

In this paper, we advance two main criticisms of the model developed by Salter and Luther. First, we argue that by casting the mistakes of the boom *purely* in an imperfect information context, they ignore what Mises called “the driving force of money” (Mises [1949] 1998, pp. 413–16). We provide quotations from Lucas and Mises to show that their views on the neutrality of money were definitely not compatible. When we consider the important role of appraisal and monetary calculation in the Misesian system, it becomes clearer why monetary injections into the banking system cause a boom. Salter and Luther's model excludes such considerations almost entirely.

Second, we argue that since Salter and Luther's model lacks a capital structure (or what we may call a time structure of production), it is unclear why, in their framework, the malinvestments in capital goods that characterize the boom will leave the economy permanently poorer. In contrast, in the traditional ABCT, all of this is straightforward.

The paper is organized as follows: section 2 summarizes Salter and Luther's analysis of the boom and explores a few important implications of their adoption of an equilibrium framework for how increases in the money supply affect the real economy. Section 3 provides our criticism of their claim that monetary misperception causes the boom in the traditional version of the ABCT. Section 4 summarizes their analysis of the bust and includes our criticism of it. Section 5 concludes.

II. Imperfect Information and Misperception: Salter and Luther on the Boom

Salter and Luther (2016) envision an economy in which firms produce two types of final goods and services: consumer goods and durable capital goods. The economy is assumed to initially be in a state of general equilibrium, where the plans of firms and households dovetail completely. Y^* units of final goods and services are produced by firms, consisting of C^* units of consumer goods and I^* units of additional durable capital goods. This state leads to a level of wealth W^* bequeathed to the next period. The whole process is sustainable.

Salter and Luther develop a theory of rational behavior in the presence of uncertainty. There is a standard framework in the tradition of Stigler (1961) and Alchian (1969), in which agents may make mistakes in a narrow sense, but broadly speaking, their strategies are rational and optimal after accounting for the costs of acquiring information and the time spent in thinking about strategies.

This long-run equilibrium is disturbed when the central bank engages in an easy money policy. This disturbance misleads agents into setting current period output higher than their sustainable levels; that is, $C > C^*$ and $I > I^*$. As they explain, “Despite having rational expectations, agents will still tend to generate systematic errors . . . in response to an unexpected monetary shock” (Salter and Luther 2016, p. 51). It is important, however, that these shocks be *unanticipated*. Salter and Luther write: “An individual response will reflect the probability that the observed change [in demand, interest rates, etc.] is merely a nominal shock. However, except in the event where it is known with certainty that the shock is purely nominal, agents will still respond to some extent” (Salter and Luther 2016, p. 51).

Salter and Luther (2016, p. 51) consider their exposition to be superior to the traditional Austrian account:

We have shown that agents with rational expectations might make errors and, moreover, that these errors can be systematic in the sense that they do not cancel out. However, the magnitude of the errors will be lower than those in the traditional Austrian business cycle theory. Agents in the model discussed herein understand that nominal shocks are possible and weight their responses accordingly. In the traditional view, agents respond naïvely to such shocks, effectively assuming the probability that the shock is purely nominal equals zero.

III. Equilibrium Analysis, Money Neutrality, and Monetary Misperception

To repeat, Salter and Luther have explicitly relied on Lucas's approach to reconciling the Phillips curve with the long-run neutrality of money: "It is not readily apparent to business owners whether an observed change in demand for their product reflects a change in relative demand or aggregate demand" (Salter and Luther 2016, p. 8). Although this approach has an undeniable theoretical elegance, and it is certain to make the ABCT more palatable to fans of modern, mainstream macroeconomics, we protest that it is a fundamental departure from the traditional ABCT.

The quickest way to demonstrate the sharp divide between Lucas and Mises is to quote their views on a hypothetical monetary thought experiment. First consider Lucas, from the conclusion of his classic 1972 paper:

This paper has been an attempt to resolve the paradox posed by Gurley, in his mild but accurate parody of Friedmanian monetary theory: "Money is a veil, but when the veil flutters, real output sputters." *The resolution has been effected by postulating economic agents free of money illusion, so that the Ricardian hypothetical experiment of a fully announced, proportional monetary expansion will have no real consequences (that is, so that money is a veil).* (p. 121, emphasis added)

Yet this was not at all the view of Mises. As he wrote in *Human Action*,

Is it possible to think of a state of affairs in which changes in the purchasing power of money occur at the same time and to the same extent with regard to all commodities and services and in proportion to the changes effected in either the demand for or the supply of money? In other words, is it possible to think of neutral money?

We imagine two systems of an evenly rotating economy A and B . The two systems are independent and in no way connected with one another. The two systems differ . . . only in the fact that to each amount of money m in A there corresponds an amount nm in B , n being greater or smaller than 1; we assume that there are no deferred payments and that the money used in both systems serves only monetary purposes. . . . Consequently the prices in the two systems are in the ratio $1:n$. Is it thinkable that conditions in A can be

altered at one stroke in such a way as to make them entirely equivalent to conditions in *B*?

The answer to this question must obviously be in the negative. He who wants to answer it in the positive must assume that a *deus ex machina* approaches every individual at the same instant, increases or decreases his cash holding by multiplying it by *n*, and tells him that henceforth he must multiply by *n* all price data which he employs in his appraisements and calculations. This cannot happen without a miracle. (Mises [1949] 1998, pp. 413–14, emphasis added)

We have emphasized the latter portion of Mises’s rejection of the Lucasian conclusion. It is not simply that Mises doubts the plausibility of augmenting every cash balance in the economy simultaneously by the same percentage growth. The problem is much deeper than that; every agent in the economy must *react* to the change in the exogenous data—including in the formation of expectations about future prices—in identical fashion. Mises rejects such a possibility as miraculous.

Because of what he calls the “driving force of money,” Mises rejects the possibility of “neutral money.” He categorically states that the “final prices to the establishment of which the market tends after the effects of the increase in the quantity of money have been fully consummated are not equal to the previous final prices multiplied by the same multiplier” (Mises [1949] 1998, p. 410).

Mises’s approach seems incompatible with that of Salter and Luther. In their model, money can only affect output and employment if agents conflate a nominal change with a real change. Furthermore, even when agents *do* make a mistake, Salter and Luther (seem to) argue that the increase in the money supply continues to affect the endogenous variables simultaneously and evenly, stimulating a simultaneous increase in the production of all the final goods and services.¹ This approach rules out the familiar “Cantillon effects” that appear in the traditional formulation. (Hayek as well stressed that monetary inflation would necessarily distort relative prices.²)

¹ Thus, while discussing the cluster of errors that characterizes the business cycle, Salter and Luther note that it results from agents being induced into “making the same type of error at roughly the same time” (Salter and Luther 2016, p. 51).

² “It seems obvious as soon as one once begins to think about it that almost any change in the amount of money, whether it does influence the price level or not, must *always* influence relative prices” (Hayek 2008c, p. 218, emphasis original). For

In our view, these differences in modeling approach reflect a deeper divide in the understanding of money's role in the market process. By focusing on information constraints and the degree to which a monetary inflation is anticipated, Salter and Luther (as well as Lucas) appear to believe that agents, when formulating their plans, try to appraise the underlying "real" data, calculate the equilibrium prices that are implied in these data, and formulate plans based on these prices. If this view were correct, then indeed it would be *possible*, given enough information, for economic agents to fully offset monetary disturbances and to avoid the boom-bust cycle. The agents would simply look to the "real" data, calculate the correct outcome, and act accordingly. That they are fooled in the real world reflects their inadequate knowledge of the economy's true parameters.

While we salute Salter and Luther's attempt to dispose of the rational expectations objection to the ABCT, we believe their solution also discards the essence of Mises's insights into the social function of money. In the traditional version of the ABCT, entrepreneurs do not make decisions based on their knowledge of the exogenous real data that characterize the economy. Their job is not to consult data on Federal Reserve activity and then forecast the long-run general equilibrium path of the economy. They instead consider only a tiny subset of all prices. To earn a profit, they must *in fact* buy goods and services *at actual prices today* and then sell output at the *actual* prices that they anticipate in the future. These appraised prices are merely the prices that they expect to encounter when they enter the various markets in which they expect to have dealings. They are not prices that will bring about a state of general equilibrium.³

This fact lies at the heart of Mises's vision of the driving force of money and the step-by-step process by which an increase in the money supply affects the various markets. Moreover, it is also

more detailed expositions of this proposition and its implications, see Mises (1953, pp. 97–165; [1949] 1998, pp. 395–447). For historical perspective on how this proposition distinguishes Austrian monetary theory from other streams of monetary thought, see Hayek (2008c, pp. 197–221).

³ As Mises notes, "An enterprising man discovers a discrepancy between the prices of the complementary factors of production and the future prices of the products as he anticipates them, and tries to take advantage of this discrepancy for his own profit. The future price he has in mind is, to be sure, not the hypothetical equilibrium price. . . . What impels a man toward change and innovation is not the vision of equilibrium prices, but the anticipation of the height of a limited number of articles as they will prevail on the market on the date at which he plans to sell" (Mises [1949] 1998, p. 707).

integral to his theory of economic calculation. It is precisely because entrepreneurs are not interested in estimating the equilibrium prices implied in the underlying real data but instead are keen to appraise the most favorable prices at which they can buy and sell goods in the various markets that they need to utilize money prices in their calculations.⁴

It follows, therefore, that an entrepreneur is interested, first and foremost, in the knowledge that helps him form his momentary expectations of the prices that will prevail in the input and output markets that he expects to participate in. Knowledge of what is happening to the money supply will not, in and of itself, help him form these expectations.

To influence his momentary expectations, the entrepreneur will need to know whether he will be in the path of this increase in the money supply. He will need to know if the potential investors in the production project that he wishes to undertake have acquired their funds as a result of an increase in the money supply or due to a change in savers' preferences. Knowledge of changes in a monetary aggregate will not, without more detailed information of the conditions prevailing in the loan market, help him understand this.

Moreover, even if the entrepreneur were to somehow learn that the more favorable nominal interest rate on offer was due to monetary expansion, he still would not change his decision to undertake the longer production process. He decides to undertake this project because, based on his appraisements and calculations, it appears profitable owing to the decline in the interest rate. His learning that this decline is due not to a change in savers' preferences but to an expansion of the money supply will not alter his expectations of input and output prices or his calculations of the profitability of various production projects.

Thus, breaking out of the equilibrium-always framework utilized by Salter and Luther and focusing instead on the process by which money ripples through the economy and on the expectations of the participants in each step of this process, we see that the commencement of the boom in the traditional version of the ABCT does not depend on agents responding naïvely to nominal shocks. The entrepreneurs who begin to lengthen the structure of production in response to a decline in the nominal rate of interest do not

⁴ For a more detailed exposition of this point, see Mises ([1949] 1998, pp. 706–11; 2000).

necessarily attach a zero probability to the possibility that it is the result of a nominal shock. In fact, it is perfectly conceivable for an entrepreneur who understands that the lowering of the interest rate on his loan is due to an increase in the money supply to nevertheless embark on a new, longer production process given his prevailing appraisements and expectations.⁵

IV. Malinvestment and the Costs of Reallocation: Salter and Luther on the Bust

In Salter and Luther's model, monetary expansion initially results in both overconsumption and overinvestment. However, when the subsequent period commences, agents no longer formulate plans based on imperfect information regarding the underlying real data. Investors quickly realize that the new capital goods produced in the previous period do not yield a rate of return that exceeds the prevailing real rate of interest, bringing the boom to an end.

The boom does, however, leave a legacy. During the bust, producers will try to reallocate the malinvested capital goods that are now in their possession. This process of reallocation is, according to Salter and Luther, costly for two reasons. First, "the factors of production are heterogeneous and ascertaining the best way to recombine them is, itself, costly," they write. And second, "Many investment decisions are, to some extent, irreversible" (Salter and Luther 2016, pp. 52–53). Both of these factors entail the utilization of capital and labor services that could have been used otherwise. As a result, the PPF shifts inward and the economy settles into a new equilibrium where output is lower.

⁵ In the traditional ABCT, the only way that entrepreneurs can form expectations that are "rational" is by reasoning, not like a businessman but as an economist. Confronted by a fall in the nominal interest rate that they know to be the result of monetary expansion, they must be willing to forego possible profit opportunities because, guided by theoretical knowledge, they realize that a boom is commencing that will inevitably end in a bust. Unlike the connection between monetary expansion and inflation, the interconnections that constitute an Austrian style boom-bust cycle are next to impossible to understand for entrepreneurs just on the basis of their economic experience. Without recourse to economic theory and an understanding of the ABCT, they will find it difficult to tease out the effects of a decline in the nominal interest rate due to monetary expansion, especially in the real world where multiple exogenous changes are all making their way through the economy at the same time. For more on this see Mises (1943), Garrison (1989, 1991), and Salerno (1995).

Thus, Salter and Luther argue that their model describes a bust that results from erroneous investments undertaken during the boom, along the lines of traditional ABCT; moreover, this bust leaves the economy poorer in the long run.

However, unlike the traditional version of the ABCT, the existence of a capital structure or a time structure of production is irrelevant to Salter and Luther's analysis of the boom and bust process. Thus, when discussing the malinvested resources that characterize the boom, they note that "whether these malinvestments conform to the specific distortions of the time structure of production discussed in the traditional ABCT is irrelevant in our view. Any investments in inappropriate projects will do" (Salter and Luther 2016, p. 52).

V. The Structure of Capital, Unsustainability, and Capital Consumption

The concept of the time structure of production holds a prominent place within the framework of traditional ABCT. Its existence implies that the available technical knowledge allows entrepreneurs to choose between production processes that involve different periods of provision.⁶ Some processes involve a shorter period of provision and a shorter period between the onset of production and the satisfaction of wants, whereas others involve longer periods of provision and a longer period between these two events. Entrepreneurs can extend the period of provision by embarking on production processes that produce consumer goods with a longer period of production or by producing consumer goods with longer durations of serviceableness.⁷ They must decide which production processes to embark upon, with the sacrifice of time involved in undertaking a longer process being compensated by the increased productivity of this process.

⁶ As Mises notes, "Action is not concerned with the future in general, but always with a definite and limited fraction of the future. This fraction is limited, on the one side, by the instant in which the action must take place. Where its other end lies depends on the actor's decision and choice. There are people who are concerned with only the impending instant. There are other people whose provident care stretches far beyond the prospective length of their own life. We may call the fraction of future time for which the actor in a definite action wants to provide in some way and to some extent, the period of provision" ([1949] 1998, pp. 477–78).

⁷ For more detailed explanations of the period of production and the duration of serviceableness, see Mises ([1949] 1998, pp. 476–80) and Böhm-Bawerk (1959, pp. 77–94).

Under these circumstances, the capital structure that exists in a state of equilibrium is determined by the amount of savings available to invest. Due to the scarcity of savings, the economy does not operate at its technological frontier. Or, stated differently, given the existing technological knowledge, there are longer, more (physically) productive processes that lie unexploited owing to the insufficiency of the available savings. It follows that an increase in the available savings and a decline in the nominal and real rates of interest leads to the adoption of some of these longer processes.

These longer production processes, however, utilize a different bundle of capital goods as compared to the shorter processes. It follows, therefore, that a lengthening of the structure of production is necessarily accompanied by a change in the techniques employed and by a change in the bundle of capital goods produced in the economy. Thus, the existence of a time structure of production implies that the techniques employed as well as the overall structure of capital are affected by changes in the interest rate.⁸

These considerations are crucial for explaining why, in the traditional version of the ABCT, the boom is unsustainable and eventually results in a bust, and why the boom and bust process leaves the economy poorer. When an increase in the money supply lowers the nominal rate of interest, entrepreneurs embark on longer, more productive production processes. However, since the available pool of savings has not grown, there are not enough savings to fund these longer processes. As a result, these investments are erroneous. It is these malinvestments that give rise to the bust.

During the bust, entrepreneurs try to reallocate the available resources. Since the existing bundle of capital goods and the various production processes employed to produce the consumer goods are not aligned with the available pool of savings, a second reshuffling of the capital structure occurs. The techniques employed to produce consumer goods must then be altered again to realign them with the available savings. This process of reshuffling commences from a different starting point, since new durable capital goods have been produced during the boom.

⁸ In the words of Hayek, “In industry as a whole an increase in the available supply of capital always necessitates a *change* in the methods of production in the sense of a transition to more capitalistic, more ‘roundabout,’ processes” (Hayek 2008a, pp. 152–53, emphasis original). Hayek repeatedly emphasized this point in several of his works on the ABCT. See, for example, Hayek (1975, 2008b, 2008c, 2009).

The equilibrium that emerges at the end of this second round of reshuffling of the capital structure differs from the one that prevailed before the boom in two important ways. First, the bundle of capital goods produced is now different. And second, the economy is now poorer than before the boom due to the consumption of capital instigated by the expansion of the money supply.

Two factors cause this capital consumption. To begin with, some of the available durable capital goods and savings are malinvested. Some new capital goods produced with their aid will, owing to their highly specific nature, be difficult to reallocate in a productive, value-adding manner during the bust's reshuffling of the capital structure. Moreover, the distortion of capital accounting due to the boom's inflation leads to entrepreneurs failing to adequately replenish their amortization or depreciation quotas.

In the traditional ABCT, the economy is rendered poorer by the boom—not due to the costly nature of resource reallocation, but due to capital consumption. In fact, since both the boom and the bust play out in a scenario of disequilibrium, there is nothing extraordinary about the bust's reallocation costs. In a state of disequilibrium, resources are always being reallocated, with entrepreneurs constantly deciding how most profitably to use the available resources.

In the framework adopted by Salter and Luther, the bundle of capital goods produced will be unaffected by interest-rate changes. In a scenario where there is no time structure of production and where firms cannot choose between production processes of different lengths, the economy will operate at its technological frontier in a state of equilibrium. In the state of equilibrium that prevails before the boom, firms would have adopted those production processes that are most productive given the constraints they face. More productive processes will not lie unexploited owing to their length.

In such a scenario, a rise in net saving and investment will not change the bundle of capital goods produced in the economy. The boom will not lead the economy to a new state of equilibrium where the firms are adopting different techniques of production as compared to the initial state of equilibrium. Instead, the increase in investment will consist of identical additions to the existing stocks of the various durable capital goods and the increase in output will result from combining the increased supply of these goods with additional amounts of labor. Since firms are already employing the

most productive processes, they will expand output without any change in the techniques employed.⁹

When the increase in investment and output is generated by an increase in the money supply, the results will be the same. Thus, in Salter and Luther's framework, the malinvestment of resources goes hand in hand with the economy operating at its technical frontier. Firms employ the same techniques of production both at the commencement and at the end of the boom.

It follows, therefore, that the bust will see the economy move back to the same equilibrium that prevailed before the boom. Since there has been no change in the production techniques employed during the boom, firms will cut back on output without changing the proportions in which they employ the factors of production—that is, the proportions in which the several heterogeneous capital goods and labor services are combined in the various production processes that are underway. When the malinvestments are revealed, they will reduce the labor employed and allow the newly produced capital goods that yield less than the real interest rate to stand idle.

Given this outcome, it is unclear why producers reallocate resources during the bust. Given that they produced the higher output during the boom utilizing the same, optimal production processes, why should they change them during the bust? The economy would revert to the equilibrium that prevailed before the boom. Thus, in Salter and Luther's model, it is unclear why firms will incur significant reallocation costs during the bust and why the boom will leave the economy poorer in the long run.

Moreover, absent this channel, it is unclear that there is any other way to explain the impoverishing legacy of the boom in their model. Given their assumption that the time structure of production is inconsequential, there is no room for capital consumption in their framework.

⁹ Hayek emphasized this point in his criticism of the underconsumptionist theories of Foster and Catchings (Hayek 2008a) and in his critique of Keynes's *Treatise on Money* (Hayek 2008b), as well as in his later works (for example, see Hayek [2009, pp. 3–13]). As he notes, in a model that assumes away the time structure of production, “the increased volume of production brought about by the new investments [that follow an increase in net savings] must be undertaken with the same methods as the smaller volume produced before the new movement took place” (Hayek 2008a, p. 152).

VI. Conclusion

Salter and Luther (2016) present a modified account of the Austrian business cycle theory utilizing a theoretical framework where the economy is always in a state of general equilibrium. An expansion in the money supply causes a boom because agents in the economy confuse a nominal with a real shock. The boom turns into a bust when they realize this mistake. Given the costs of reallocating the capital goods that were erroneously produced during the boom, the economy is left poorer in the long run as a result of it.

In this paper, we have criticized the analysis of both the boom and the bust advanced by Salter and Luther (2016). We argue that their attempt to describe the boom *merely* as a confusion of nominal with real shocks ignores the driving force of money as stressed by Mises. Moreover, because Salter and Luther's model lacks a sufficiently rich capital structure, it is not obvious why the boom should leave the economy poorer.

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