

New Perspectives on Political Economy
Volume 2, Number 2, 2006, pp. 26 – 85

Tyler Cowen on Austrian Business Cycle Theory: A Critique

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JEL Classification: E32

Abstract: Cowen (1997) criticizes Austrian Business Cycle Theory (ABCT) on eight grounds: 1. systematic errors; 2. inflation volatility; 3. confusion of inflation and savings; 4. confusion of inflation and investment; 5. real vs. nominal rates of interest; 6. interest rate information; 7. investor interpretation of interest rates; 8. validation of inflationary investments. The present paper rejects all of these claims, and defends ABCT against them.

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1 Introduction

In recent years, there have been several criticisms of Austrian Business Cycle Theory (ABCT). These include Hummel (1979), Tullock (1987, 1989), Cowen (1997), and Wagner (2000). Replies have been made to Hummel by Barnett and Block (forthcoming A); to Tullock (1987) by Salerno (1989); to Tullock (1987 and 1989) by Barnett and Block (forthcoming B); and, to Wagner by Block (2001). The present paper is devoted to an analysis and rejoinder to Cowen's (1997) particular critique of ABCT.

This critique of ABCT is contained in Cowen (1997, Ch. 4), where he argues that ABCT fails for the eight (8) following reasons: 1. systematic errors; 2. inflation volatility; 3. confusion of inflation and savings; 4. confusion of inflation and investment; 5. real vs. nominal rates of interest; 6. interest rate information; 7. investor interpretation of interest rates; 8. validation of inflationary investments. Following section 2, in which we offer a general perspective, the remainder of our paper is organized along the same lines. Our method shall be to quote liberally from Cowen (1997), and then offer specific criticisms.¹ We conclude in section 11.

2 An Austrian perspective

Assume that, initially, the allocation of cheese and chalk was in its optimal ratio, say, 1:1. Then, government, in its infinite wisdom decides that the proper allocation between these two items is *not* the one that stems from posited unchanging consumer preferences, but rather 2:1 in favor of cheese.

With the truly heroic assumption of *full* information, we all know *exactly* how long this subsidy will last. Suppose this to be for one year; after that, we return to *laissez faire* capitalism, where things like this are simply not done. Would anyone now reallocate some investment from the chalk industry to cheese? The answer depends upon the expected profitability of the reallocation. Obviously it is yes if: 1) the resources we are talking about are non-specific to either industry; and, 2) the costs (if there be any) of real-

¹ Cowen (1997, 16, 102-104) compares ABCT with his "risk-based" theory. It should be noted that he uses the term "risk" in the standard probabilistic way, and that true uncertainty of the type experience in the real world does not play a part therein.

location, including resources complementary to the reallocated capital goods, from chalk to cheese and then back is zero, or at least less than the expected increase in revenue² to be had from the temporary reallocation. If, instead, the resources under consideration were absolutely specific to cheese, the answer is neither so obvious nor unambiguous. Of course, it still depends upon the expected profitability, but that is now a more complex matter, involving future periods beyond that of the temporary, one-year intervention, as well as the expected economic life of the diverted resources. The following factors³ would, *ceteris paribus*, make the reallocation profitable:

1. A higher discount rate, as that would reduce the present value of any cash flows in the post-first-year periods, lessening such offsets to the first year gains.
2. A longer economic life of the diverted resources, as this will reduce the cost of producing cheese not only in the first year, but in the later years, also. (This assumes that the resources diverted to the production of cheese, though specific to the production thereof, are not used in Leontief-type; i.e., fixed proportions production processes, and thus do not become redundant when the production of cheese is scaled back, but rather that they then substitute for other resources that would have been used. That is, because of the existence of the diverted resources, the optimal mix of inputs with which to produce cheese has changed reducing the need, at any level of output, for investments complementary to the diverted ones.)
3. The higher the cost of the complementary resources made unnecessary for the production of cheese in later years because of the diverted resources.
4. The smaller the increase in quantity, and the lower the price, of the additional resources (necessitated by the shortfall of fixed capital because of the diverted resources) necessary to produce chalk in accord with the optimal ratio, post intervention.

² That is, if the total revenue from cheese and chalk combined would be greater than without the reallocation.

³ This is but a partial list; e.g., we do not inquire into depreciation of preexisting fixed resources used in the production of either good, or to what extent the diverted resources were gross or net investment, nor do we consider the issue of heterogeneity of fixed resources with the new ones being superior to the old.

Now assume, instead of a subsidy, that interest rates were pushed down below the level that would otherwise have obtained, based on the time preferences of the public, by similar governmental policies (e.g., by the central bank flooding the credit market). After that, we again return to laissez faire capitalism, where things like this are simply not done. Would the pattern of investment, or for that matter, expenditures on consumers' goods, be any different than they would have been in the absence of this governmental interference with the economy? Certainly there are specific circumstances where there would be differences. It is easiest to see this in the case of consumers' goods. Some individuals might buy furniture, major appliances, or expensive consumers' electronics, and even automobiles on credit, even if they were to go into debt for more than a year, if the monthly payments in the first year were sufficiently decreased. That is, the lower interest rates, even though only for a year, do reduce the costs of buying on credit. This would be sufficient to induce consumers at, and some near, the margin to make such purchases.⁴

What is true for consumers is no less true for businesses. A decrease in interest rates reduces the cost of investing in interest-rate-sensitive projects. Such undertakings produce capital goods whose contributions to the production of consumers' goods occur a relatively long time before the pecuniary value of the consumers' goods are realized;⁵ and/or very durable capital goods whose contribution to the production take place over relatively long periods of time; and/or very expensive capital goods the purchases of which are financed by means of credit.⁶ In all these cases, lower interest rates can be expected to have a disproportionately positive effect upon their profitability.

What we are saying is that there is no difference in principle between inter-temporal

⁴ A simple example: Joe rates his alternatives, A, B, C, D . . . , such that A and B are the top two, with $A > B$, where B is the purchase of a boat (Z), that he expects to have an economic life of 20 years, with monthly payments of \$1,000 for the next five years. Then, because of Fed policy, Joe has a new alternative, C, where C is the purchase of the same boat, Z, with monthly payments of \$500 for the first year and \$1,000 for the next four years. Although Joe previously preferred A to B, he now prefers C to A.

⁵ From the point of view of the producers, this realization occurs when the goods are first sold to consumers, because it is the revenue from these sales that, ultimately, pays for the resources used to produce the goods. To the extent that the revenues are insufficient to cover the resource payments, either the firms' owners, or its creditors, including its suppliers of resources, incur a loss.

⁶ The latter type of goods are those for which credit is normally a complement; i.e., although they may be purchased without credit, because they are so expensive, they are usually purchased on credit and thus credit is a complement to these items.

misallocations of resources stemming from statist interferences with markets such as cheese and chalk and intra-temporal ones. *Both* misallocate resources, even under heroic assumptions about information. And, both do so for the same reason: intervention, in order to have any effect must alter the set of alternatives available to the decision maker thereby inducing him to act differently than he otherwise would have. This is a praxeological claim, not a contingent one.

But, if the government is to “succeed” in ruining market coordination, again under these assumptions, then at least some entrepreneurs (or households) must be led by the invisible hand of profit seeking to act as they would not have otherwise done, to misallocate resources in the first place. That is, if all far-seeing businessmen refuse to act differently than they otherwise would in the face of these governmental programs, either of them, the intra-temporal one between chalk and cheese, *or* the inter-temporal one between different capital-goods projects, then, the state *could not* render markets inefficient.⁷ In fact, the whole purpose and result of intervention is to alter people’s behaviors. And, in the cases where it wants to “stimulate” the economy, the government will continue to lower rates until a response is forthcoming.⁸

⁷ Suppose under *laissez faire* our political masters suddenly institute a minimum wage law of \$0.01 per hour (assume that no one has a marginal revenue product of less than \$1.00 per hour), or maximum hours legislation of 200 hours per week (there are fewer hours in the week than that). Will any of this “bite?” It will, if these enactments demonstrate to market participants that government has gone off the rails and embraced economic fascism. For example, Higgs (1997, 563-564) maintains that the dearth of private investment in the U.S.A. from 1935-1940 was the result of FDR’s policies in the “Second New Deal” that undermined confidence in the security of property rights.

⁸ And, not to worry about a “liquidity trap,” for as the then, and now former, Vice-chairman of the Board of Governors of the Federal Reserve System, ex Chairman of the President’s Council of Economic Advisors, and present Chairman of the Board of Governors, Ben S. “Benny the Printer” Bernanke (2002) stated: “Indeed, under a fiat (that is, paper) money system, a government (in practice, the central bank in cooperation with other agencies) should always be able to generate increased nominal spending and inflation, even when the short-term nominal interest rate is at zero.” A liquidity trap is said to occur when the relevant interest rate is so low that the “demand for money” is infinite. Of course, there is no such thing as the demand for money; rather there are as many different demands for money as there are goods, including resources and financial assets, for sale for money. What must be meant by that term is, then, an infinite supply of notes by potential borrowers will be offered at “the” interest rate. Of course, not all potential borrowers are equally credit worthy, and thus the risk-adjusted interest rate decreases as additional loans are made at the same nominal rate to borrowers who are ever-less creditworthy. If expectations as to the future course of prices are important in understanding credit markets and their impacts on economic activity, so too are the differing degrees of credit worthiness among borrowers. Thus the only real liquidity trap that could occur would not arise from the demand-side (supply of notes) of a credit market, but, rather, from the supply-side (demand for notes), when potential creditors refuse to make any more loans because the “real” risk-adjusted interest rate is too low. This can occur in the case of banks

From this perspective, there will be no “holding of the bag” phenomenon in operation. Critics of ABCT typically maintain that according to its premises, if entrepreneurs are far sighted enough, they will not make misallocative business decisions in response to inter-temporal governmental mismanagement. They will refrain, out of the fear that if they do, then, when the crunch comes and government stops its program, they will be stuck with an investment they would not otherwise have made. Nor will there be any yokel or greenhorn who will bail them out, since *all* market participants are in this model assumed to have full, complete and total information.

Of course, these assumptions are outlandish. There is nothing like full information available in the real world. Not only has an appreciation for ABCT not taken over the business community,⁹ it has not even done so within the profession of economics.¹⁰ That being the case, there should be little real fear that government cannot create an ABC. We are arguing here, on the basis of contrary to fact conditionals. The present authors maintain that ABCT is so incisive and powerful an explanation that it would operate *even in* this heady non-existent world. That is, *even if* all market participants were not only fully cognizant of ABCT, but were also fully and totally informed about the decisions of the central bankers and, in addition, all consumers and firms, ABCT would *still* be correct. We claim it is an underestimate of ABCT to posit that inter-temporal misallocation due to money creation and funneling through the credit market works *only* through lack of information. Moreover, in reality, many businesses and industries are well aware of the “Too big to fail” syndrome.¹¹ The point is that in the real world the idea of full

regardless of the quantity of excess reserves in the banking system, when, because of the increased risk of default on marginal loans, they are perceived to be unprofitable, and so are not made. This seems to have been the case in the U.S.A during part of the Great Depression (Hall and Ferguson, 1998, 148-149).

⁹ Understatement of the century.

¹⁰ Another understatement of the century :).

¹¹ For example, in their applied work, many Austrians maintain the following. The immense monetary expansion of the 1990s, especially in the latter half of that decade caused the massive stock market bubble. The Fed, fearing inflation, engaged in monetary tightening in 1999. That policy was the *proximate*, but not the ultimate, cause of the bursting of the bubble. The manifestation of this bubble in the “real” sector was the vast, but unwarranted, expansion of infrastructure and equipment in and for, and the huge misallocation of human resources to, the information/communication/technology sector. Then, in an attempt to stave off a severe downturn in the “real” economy and that great bugbear of mainstream economists, price deflation, in the wake of the collapse of the stock market, the Fed began reflating money/credit. That led to the next bubble, the current (2005-6) one, that also must burst. (So as there were various symptoms of the stock market bubble, so also are there symptoms of a real estate bubble.) Had the Fed not reflated, there neither would nor could have been this real estate bubble. All of which

(or complete or perfect) information is absurd. However, sometimes decision makers do have sufficient information to know that activities they might undertake in response to a Fed engineered money/credit expansion, with consequent reductions in interest rates, will, in all likelihood, prove unprofitable if the Fed reverses itself, causing interest rates to rise, even to the point of bankrupting them. Nevertheless, they may rationally undertake such activities hoping to make big profits before the Fed changes its policy, fully expecting the Treasury to bail them out and, indirectly, also rescue their creditors, if they prove to have been mistaken. Of course, they are able to become so highly leveraged because their creditors also fully expect such bailouts. Consequently, even if they know and understand ABCT, and even if they know that, without the possibility of a bailout, they would not engage in certain activities, nevertheless they *do* engage in them.

Let us attempt to put this into other words, so important is this point. The ABCT is a theory about how people's actions are affected (changed) by a particular type of governmental intervention. Even in a world of perfect competition (we assume, *arguendo*, that this concept is a coherent one), were new fiat money to be lent into existence there would necessarily be a distortion in the structure of prices that would change the sets of alternatives individuals face, and thus have real effects. The perfectly competitive model beloved of neoclassical economics includes, of course, perfect information. But the relevant information is about current and past prices and quantities of goods, assets, and resources, and about monetary policy: the Fed's pattern of increasing money/credit, and the period before the policy reverts. But even perfect competition cannot include information about the future. That would bring us to the world of science fiction, or magic.

Injection effects and their consequent distribution effects, are such that the economy

brings us to the point at hand. Although the Fed must bear the ultimate blame for the real estate boom, there is enough blame to spread around to other parties that aided and abetted them. (We use them, rather than it, in keeping with the Austrian understanding that it is only individual people who act, not nonhuman "its.") Inter alios, and probably most important, were the folks at Fannie Mae and Freddie Mac. They facilitated the real estate boom in a variety of ways. But what is relevant here is that in so doing they both expanded their balance sheets immensely, and did so by vastly increasing their leverage, which they were able to do to the extent they did only because they, and everyone else, understand their debt to be guaranteed by the U.S. Treasury, if not legally, then morally and practically – a major case of moral hazard, though not of the same magnitude as that involved in Social Security and Medicare. That is, they have become "Too big to fail." They know it and so does everyone else. And, what is true of Fannie and Freddie, now, was true in the past for various corporations, banks, and even a city (e.g., Chrysler, Continental Illinois, and New York City, respectively).

would be tilted in favor of interest-rate-sensitive goods and their producers; i.e., there would be an ABC, though milder, because of the perfect competitive (PC) assumptions.¹² That is, the effect of a money/credit expansion in a perfectly-competitive world would be a misallocation of resources that reduces people-in-general's well-being. From God's point of view, people "in general" would be better off if, in response to the Fed's attempt to expand money/credit through open market operations, no one would sell securities to it; or if, when they tried to use discount rate policy, no bank would borrow any more reserves than they otherwise would have; or, if, when they lowered the reserve ratio, banks just held excess reserves and made no additional loans. However, because of changed incentives resulting from the Fed's policy, and consequent injection and distribution effects, some people are presented with alternatives superior to those extant. They respond and thus, though, people-as-a-whole are worse off, not all are; some find they are better off because of the Fed's¹³ actions.¹⁴

¹² Of relevance here are Barnett and Wood, 2002; Barnett and Block, unpublished, which concentrate on all interest-rate-sensitive goods, rather than traditional ABCT that focuses on the Hayekian triangle Barnett and Block, forthcoming B, and "higher-order" goods.

¹³ There is another problem with the use of these unrealistic, imaginary, worlds (in contradistinction to sane imaginary worlds; e.g., the type free-market entrepreneurs imagine in trying to decide the best uses of resources). Consider a world of perfect competition and efficient markets, all-round, with attendant absurd assumptions about information. Suppose the government (Fed) to announce a policy of increasing the money supply by purchasing specific quantities of 90-day T-bills at specific times for the next year, after which there would be no further purchases. Assume, also, that everyone knows the correct, economic model of the economy; i.e., how the economy works, and that they use this knowledge plus the information about monetary policy to form (obviously, rational) expectations. But how could this be? Such a system would have inherent contradictions built into it.

In order for the Fed to execute its monetary policy, it would have bid up the price of the T-bills in order to purchase them, causing the nominal interest rates thereon to decrease. However, the increased money supply would cause inflation immediately, not with a lag, because of all the "perfect" conditions (PC). Again, because of the PC, expectations of price-inflation would immediately increase to the correct "level." Even were the creditor (the Fed, as the buyer of the T-bills) willing to take a loss by bidding up the price of the T-bills and thereby accepting a lower yield thereon, other, rational, profit maximizing "agents" would not be. In fact, they would know that the prices of these T-bills (and other, fixed-income, securities) should fall thereby driving up the expected, nominal, rates of interest on them, so that the expected, real, rates of interest would not decrease.

Therefore, as the Fed tried to buy the T-bills, putting upward pressure on their prices, the entire stock of extant T-bills would be offered to them. In order to keep their prices from falling, the Fed would have to buy the entire stock, and not just of T-bills, but of all other assets, real, as well as financial, else all of their prices would fall so that their nominal yields would increase to offset the correctly-expected-by-all, and thus immediate, price inflation. (Side note: Such PC requires, then, not just that expectations about "level of prices" be correct, but that expectations about the course of very individual price be correct.)

As the purpose of the monetary policy is, ostensibly, to stimulate the economy, else why do it? (Of course the real answer is to enrich the government, and the banks and other financial institutions – really

Cowen (1997, 79) quotes Rothbard (1975, 19, emphasis added by present authors) to the effect that "... businessmen were *mised* by bank credit inflation to invest too much in higher-order capital goods..." and then criticizes him on the ground that with full information, such cluster of errors are impossible. But Rothbard was writing in the real world context of (far) less than full information.¹⁵ Were this analysis to be applied to the unrealistic full information of the critics of ABCT, then Rothbard's "mised" would have to be replaced with "induced," or "subsidized."¹⁶

the politicians, bureaucrats and other government employees, and the owners and employees of financial institutions). But certainly, given a PC world, such policy could not possibly bring about the ostensible, desired end.

¹⁴ Creating machines or other factors that fit into the higher orders of the structure of production does not necessarily imply that the investment will last for a longer time-period. How long it lasts can, within limits of course, be tailored to suit. All that is required for higher order capital investment is that the new material is complementary to other goods and services which function in that arena of the economy.

¹⁵ Whatever that means. We are writing, arguendo, as if the concept of "full information" is a completely coherent one. It is not. The difficulties with it are legion. The only things it is possible to have "full information" about are historical facts including, in some sense, "present facts." One can *know* nothing of the future, save what one expects about it, including; e.g., what one expects (not on the basis of thymology, but, rather because that is what someone has said he will do) others to do.

¹⁶ Cowen (1997, 77) states: "The postulated entrepreneurial mistakes in the traditional Austrian theory, which are systematic, violate the rational expectations hypothesis. Entrepreneurs with rational expectations will sometimes choose unprofitable term-lengths for investment, but they will not err systematically towards excessive term-length. This is precisely the error made by Wagner (2000). For a rejoinder, see Block (2001). Cowen (1997, 8), states "the rational expectations assumption serves as a tool of analytical organization, rather than as a descriptive assumption about the real world. Rational expectations models help us trace which economic results can be generated without assuming systematic forecasting errors and which cannot. Whenever we wish to specify a coordination problem, rational expectations theory requires us to justify, or at least outline, the underlying informational asymmetries. I view the rational expectations assumptions as a useful form of discipline. Rational expectations does not rule out significant marketplace errors, but it does require us to specify the source of these errors in some explicit informational asymmetry." This is incorrect. This is a way of claiming that, although it is not a good assumption about the real world, it is still a useful assumption – akin to Friedman's (1953) methodology, except instead of asking if a model predicts well, using the assumption for "discipline" purposes. Cowen's (1997, 8) definition of rational expectations is in terms of an individual's expectations. In his footnote 3, p.9, he attempts to finesse the problem he has created. Moreover, he assumes risk, not uncertainty. The key is the assumption of no systematic errors. First, the idea that: "Even if the idea of a population mean is not well defined, individual forecasts may, on average, still hit the mean of the observed sample," makes no sense unless the sample is defined. So, exactly what events constitute the sample?" Most (all other?) rational expectations models quantify the concept; e.g., Snowdon, et al., p 190. The idea of rational expectations is highly problematic. Consider, if we believe in cause and effect, then the causes of the stock market meltdown in 2000 preceded the effect, the meltdown itself. If individuals' expectations are rational, how is it that so many made mistakes? Of course, the systematic entrepreneurial "cluster" of errors of ABCT violate the assumption of rational expectations – that is a strength of ABCT. The very concept of rational expectations is irrational in the sense of comporting with reality, though its use is compatible with the

Similarly, Cowen (1997, 78, emphasis, and material in brackets added by present authors) claims “For the [ABC] theory to hold, entrepreneurs must be *fooled* by incorrect price signals emanating from the interest rate.” Again, the same reply is in order: in the real world of vastly imperfect foresight and governmental intervention, there are two sources of systematic entrepreneurial errors: imperfect foresight and governmentally-distorted incentives. In fact, in the real world either of these alone is sufficient to cause such errors. Thus, in the imaginary one concocted by Cowen, “fooled” would have to be changed to “encouraged” or “provoked,” as, by assumption, the former cause is not allowed.

3 Systematic errors

States Cowen (1997, 81): “The Austrian claim postulates systematic entrepreneurial errors in the most costly direction. Entrepreneurs do not merely err in their choice of term-length; entrepreneurs choose excessive investment term-length when confronted with inflation. More specifically, the theory does not allow entrepreneurs to overestimate the dangers of an inflationary boom by keeping investment term-length too short. Excessive caution may be just as likely as excessive boldness.”

First, in order for entrepreneurs to misestimate, whether over or under, the effects of an inflationary boom, they must perceive there to be one. However, although “inflation is always and everywhere a monetary phenomenon” (Friedman, 1992, 262), the way the term is used differs. When Cowen refers to entrepreneurs misestimating the dangers of inflation, it is obvious he uses the term to mean an increase in the general level of prices, not, as Austrians do, an increase in the money supply. This is an important point, for as Friedman (1968, 15) has maintained, there is a long and variable lag between the onset of an increase in the stock of money and its attendant effects on the general level of prices. However, because the new money is lent into existence its effects are felt sooner in the credit markets; i.e., interest rates, usually short-term rates, are affected

advancement of modern academic macroeconomists, whereas the assumptions of ABCT are consistent with reality.

first. Entrepreneurs do not, as a rule, follow changes in the stock of money.¹⁷ Thus, by the time the price inflation is perceived by them, they will already have responded to the changed interest rates, both because of a lack of information and because of altered incentives.¹⁸

In this our author demonstrates that his command of economic theory is not all that it could be. We must reject this facile equation of caution with lower orders of capital goods (or consumer goods) and boldness with higher orders. Nothing could be further from the truth. Neither capital goods nor consumer goods, neither higher nor lower orders of the former, are intrinsically more risky¹⁹ than the other. The mistake stems

¹⁷ Even were they to attempt to do so, they would find themselves in a quandary: of which monetary aggregate should they follow the statistics? M1? M2? M3? MZM? Remember that it was not that long ago that MZM did not exist, and, there were such things as M9 and L (for liquidity).

¹⁸ Cowen (1997, 8-9) maintains that the rational expectations assumption disciplines his thinking by forcing him to consider the sources of “asymmetrical” information. However, insofar as ABCT is concerned with expectations, it is with expectations that prove to be incorrect. He maintains one has to identify the source of such “asymmetrical” information, as if symmetrical information were the normal course of events. Regardless, even if information were symmetrical, in the real world expectations would not always prove to be correct. The real issues are the sources and magnitudes of the expectational errors. As noted above, it is the long and variable lags between changes in the money stock and their effects on prices, as well as the injection and distribution effects, that are the sources of these errors. (Even without this source, people would still make expectational errors because they are human.) These errors tend to be systematic because the increases in the money stock affect interest rates and the prices of financial assets before they affect other prices. Of course, the magnitude of these errors depends upon the size of the increase in the money supply. It should be noted that, in a hyperinflation, when everyone is sensitized to inflation, the lags tend to be shorter. As to rational expectations, if it is to mean merely that a decision maker makes the best forecasts he can based on all the information available to him, while allowing for his forecasts to be affected by his emotions, and admitting of systematic errors, Austrians would have no problem with that. However, as soon as rational expectations is taken to mean no systematic forecasting errors, Austrians must part ways, as there is no praxeological reason to think that such errors are not made, and there is plenty of real world evidence that they are; e.g., the winner’s curse in auctions, including mergers and acquisitions involving other than consumers’ goods; and, gambling to win, as opposed to for pleasure, against the house.

¹⁹ Cowen (1997, 16) states:

The focus on investment risk defines the context for the business cycle theory of this chapter [Ch.2 A Risk-based Theory in Real terms]. Real business cycle theories focus on the risk or volatility induced by technology shocks. Traditional Austrian theories identify the risks created by distortionary monetary policies by the central bank. Neo-Keynesian theories, although they view risk in implicit terms, concentrate their attention on the risk of non-clearing markets. In contrast to these theories, I [Cowen] focus on the risks that investments will not match consumer demands, and thus will decline in value. Technology shocks, monetary policy, and non-market-clearing prices all may constitute particular causes of supply/demand mismatches, and in this sense a risk-based theory does not contradict the options listed. None the less I focus on the initial willingness of entrepreneurs

from Cowen's assumption that the further away from final sale of the consumer good, the more things can go wrong, and therefore, the more risky it is. But this is to confuse the micro with the macro; the total with the marginal. Yes, if you compare *all* of capital goods orders with but the lowest of them, *then* what Cowen says has a modicum of sense. Surely there is more that can go wrong, and thus lead to bankruptcy, when you compare more things with fewer. But when we compare any *one* stage of production, with *any* other, high or low, this no longer holds. For, if each stage of production takes the exact same single year to complete, the *investment of any one man* has the *same* length of run as that of any other. For example, A invests in something that is 12 years away from consumption, and gets out one year later, when it is now 11 years away. In contrast, B invests in something that is 2 years away from consumption, and gets out one year later, when it is now 1 year away. Each of them invests for the same identical 12 months. It is unclear why Cowen would consider A's investment "longer" than B's, unless he is under the sway of the confusion we attribute to him. If Cowen were correct, then corner grocery stores, or greasy spoons, would rarely go broke since they are so close in time to final consumption, and by that fact alone were safer harbors for cash. Not at all. Indeed, if there were any truth to this contention, the tendency of the market would be to *lower* profitability there, so as to render the expected return on investment equal in all regions of the structure of production.

Let us argue by analogy. Suppose someone to have claimed that high priced items (Mercedes, Rolex, diamonds, lobster) were more risky to produce and sell than lower priced ones (Ladas, Timex, bread, corn). It would be relatively easy to see the fallacy: you can lose just as much money manufacturing a Chevy as a Rolls Royce. This is a confusion of big and small ticket items with high and low risk. There is some plausibility here (it costs more to produce any one Mercedes than any one Lada), but this is only superficial. If there *were* any bias in this direction, it would soon enough be incorporated by markets.

to accept vulnerable positions with regard to shocks in general, rather than on a single kind of shock.

Cowen thinks that because his theory "focus[es] on the risks that investments will not match consumer demands it "contrast[s]" with "traditional Austrian theories" because the latter identify the risks created by distortionary monetary policies." However, according to "traditional" ABCT the risks created by distortionary monetary policies are *precisely* the risks that investments will not match consumer preferences. This is standard ABCT, and has been ever since it was first enunciated (in however rudimentary form) in 1912 by Mises (1912 [1971], 362).

Cowen (1997, 81) asks: What happens if entrepreneurs take lower interest rates resulting from increased savings to be a sign of price inflation, which they consider risky, and are inflation-risk averse.” His answer is that they would shift from long-term investments to short-term investments. But this is an absurd assumption. Professional economists, maintaining different models of reality, don’t agree on the causes of lower interest rates in specific cases. And, Cowen ignores the incentive effect thereof. It is much like saying, Suppose an entrepreneur is afraid of inflation and responds to an increase in the price of his products by reducing production. There is no reason to think that, in the real world, entrepreneurs take lower interest rates to be a sign of inflation. This happens only in Cowen’s “mirror image” world – the mirror he used must be Alice’s, for his mirror image world bears as much resemblance to the real world as hers did.

We of course agree with Cowen that, *ceteris paribus* there is more “risk” in long-term investment projects than in short-term projects.²⁰ But this is irrelevant. We need both. Moreover, merely because an investment project is relevant to an early stage of a production process does not mean that it is a long-term investment. In fact, it may be a short-term investment for an investor who is not invested in the rest of the process. And, this is true even if the project is relevant to a stage of the larger process that occurs long before the process reaches fruition in the form of consumers’ goods. It is also true even if the project involves durable (capital) goods that will contribute to the production of many “batches” of consumers’ goods over an extended period of time. For example, consider the manufacturer who makes drilling pipe for oil exploration and needs to finance his purchases of steel pipe. He is concerned with the short-term interest rate and is not going to reduce his borrowings to purchase an inventory of steel pipe when interest rates decline. This is obvious when we see people increase their purchases of stocks, especially on margin, and borrow to purchase real estate by selling adjustable rate notes, when short-term rates decline. That is, investors are concerned not with “the period of production,” of some project they invest in, but, rather, they are concerned with “the period for which they are invested” in that project.

Cowen zigs where he should be zagging. He (1997, 81) invents a “mirror image” of

²⁰ Are we contradicting ourselves? We just said that a rose is a rose is a rose: a one year investment is a one year investment is a one year investment, and it does not matter where, in the structure of production it is. But there is a significant difference between a one year investment and a ten year investment, no matter where each enters the production process.

ABCT where when interest rates fall, entrepreneurs attribute this to inflation, when in reality it is the result of increased savings. He castigates Austrians for not addressing “why the mirror image scenario is less plausible than the case they emphasize.” We have a similar complaint about Cowen and other neoclassical critics of Austrianism: why do they not address the issue we are now making up that calls for entrepreneurs to avoid profit making “unicorn” ventures in favor of those that bring losses? The answer to both is that they have not been addressed because they have just been manufactured out of the whole cloth and are silly to boot. Any firm embracing losing unicorn ventures vis-à-vis profit making ones will soon enough be consigned to the dustbin of economics.

Entrepreneurs who act as Cowen would have them do will incur losses and will be weeded out by the market process. The challenge Austrians have faced and met is to explain why the ordinary profit and loss considerations do not preclude the cluster of errors attendant upon the governmental intervention considered in ABCT. The answer of praxeologists is that in the less than full information world firms have no way of distinguishing a fall in interest rates which emanates from increased savings (a greater orientation to the future) from one that is a result of central bank meddling with credit markets. In the imaginary full information model, we note that it is no longer a cluster of errors which accounts for the structure of production being bent out of shape, but rather purposeful human action to this same end, taking advantage of government subsidies.

Another difficulty with Cowen’s (1997, 82) analysis is his expectation that the marginal entrepreneur would be “risk averse.” This of course is not a matter of praxeology, but rather of economic history. Nevertheless, it is more than passing curious that he would rely so heavily on the owners of firms not being risk takers. One would have thought that this would be the expected situation. After all, to set up a business is intrinsically a risky endeavor.

As per Mises (1998), every action is risky, but some are riskier than others, at least if we consider not just the potential for loss, but also the relevant magnitudes. Also, and certainly to the extent that managers are playing with other people’s money, there is a principal-agent problem. It seems certain that agents, who in many cases make the decisions for the owners, and thus are in some sense the entrepreneurs, are more likely to engage in risky behavior. If Cowen thinks that agent-entrepreneurs are risk averse, how does he explain such things as the S&L debacle of the ‘80s, and the various ventures un-

dertaken with governmental funding or implicit guarantees; e.g., Fannie Mae and Freddie Mac; and Enron, etc.?

States Cowen (1997, 82, fn. 7): “The original Austrian theory, for reasons not fully explicated by its advocates, associates the move from long-term investments to short-term investments with an economic bust. Within the same framework, entrepreneurial moves from short-term to long-term investments cause an economic boom. . . .”

Contrary to Cowen, these are points well articulated in the ABCT literature.²¹ But we should clarify. These are not any old “moves” from one to another; very much to the contrary, they stem from governmental incursions into the economy. If entrepreneurs are shifting from long to short or vice versa in response to changing consumer time preferences, then there is no boom or bust at all.

Perhaps it is his insistence on rational expectations that causes him to frame changes in the stock of money in terms of information, rather than incentives. Cowen, apparently, does not see that governmental monetary policy can alter incentives in ways that lead to an unsustainable boom.

4 Inflation volatility²²

According to Cowen (1997, 83): “The economic volatility associated with inflation provides one reason why entrepreneurs might respond to monetary shocks by decreasing rather than increasing long-term investment.”

We agree with Cowen that governmental inflationary policy adds to price volatility, and that this, in turn, renders all decision-making less certain. And, that this has a

²¹ See, for example, Hayek (1935) and Rothbard (1963 [1975]).

²² Cowen (1997) is guilty of a sin common enough among economists, but not serious scientists: a failure to define his terms. Thus, “volatility” makes its first appearance on page 36: “. . . and, increases in uncertainty or economic volatility.” From the context, and material on page 26, it seems that Cowen either views uncertainty and volatility as the same thing or, at least, assumes a very high degree of correlation between them. But, surely, uncertainty and volatility are not the same thing. In that case, it is incumbent upon him to tell us what he means by this word “volatility.” Although it would seem that volatility causes uncertainty, there is no reason to think that uncertainty causes volatility. In fact, an increase in uncertainty might well reduce volatility by inducing people to engage in less risky behavior, risky behavior being itself a cause of volatility.

systematic effect on the structure of production because the more interest-rate-sensitive goods are more risky than those less sensitive. What Cowen gets wrong, or ignores, is the temporal sequence of events. It is only some time after the increase in money/credit has driven interest rates below what they otherwise would have been that the effects are felt on prices; i.e., that the price inflation is felt. It is at *that* point that lenders and borrowers start to build inflation expectations, both as to levels and as to volatility, into their thinking. This causes the former to demand, and the latter to be willing to agree to offer or supply, an inflation premium in the form of higher rates of interest.

Of course, part of the increase in rates is an attempt to reestablish the real rate that had decreased when the nominal rates declined before the inflation expectations changed. But part of the increase is an attempt to boost real rates because of the perceived rise in risk attendant upon expected higher rates of inflation with the concomitant increased risk that results from the fact that an incorrect forecast of any percentage leads to a greater mistake in absolute terms the greater the actual rate turns out to be. For example, if someone expected inflation to be 3% and at the same time realized he might be mistaken, and if he thought he might be off by as much as 33.3%, then if he entered a credit contract at 3% as a lender (borrower) and inflation turned out to be at the high (low) end of his range, 4% (2%), his real rate is 1% less (greater) than he expected, and he is worse off by 1%. Alternatively, if he expected the rate of inflation to be 30% and, again, realized he might be mistaken, and if he thought, again, that he might be off by as much as 33.3%, then if he entered a credit contract at 30% as a lender (borrower) and inflation turned out to be at the high (low) end of his range, 40% (20%), his real rate is 10% less (greater) than he expected, and he is worse off by 10%.

Certainly, the potential for a greater loss at higher expected rates is sufficient to cause an increase in the rates demanded by lenders, and, as a consequence, a reduction in the total pecuniary value of loans contracted. At the higher rates, fewer creditworthy borrowers are willing to take out loans, and lenders become, at least at some point, more demanding in terms of the creditworthiness of borrowers. This leads to a contraction of credit. This is what Austrians refer to as the crisis: it ends the unsustainable boom and precedes the bust. What Cowen (1997, 83) seems to have missed is the timing, when he states: "The economic volatility associated with inflation provides one reason why entrepreneurs might respond to monetary shocks by decreasing rather than increasing

long-term investment.” This is correct, but misleading as it ignores the time element. He implies that the price inflation is concurrent with the monetary shock, which, of course, it is not; rather the inflation, and hence the “economic volatility associated” therewith, occurs later, and therefore, so does the decrease in long-term investment. But according to Austrian economists that, *inter alia*, is precisely what happens when the boom set off by the monetary shock can no longer be sustained. Of course, during the interim, the monetary shocks drive down real and nominal interest rates misleading entrepreneurs into increasing investment.

Here is another way of seeing this point. Consider what happens when the Fed engages in open market operations to increase the supply of money/credit. The Fed buys T-Bills from A, setting in motion a portfolio adjustment process that will eventually affect the yields on all assets. *Ceteris paribus*, if the interest rate falls, this disproportionately impacts the higher orders more than the lower, in a positive direction. A lower interest rate raises all present discounted values of future income streams, but much more so the further away in time from completion they are. For example, at 12% the present discounted value of a dollar receivable 1 year from now is \$0.8933, whereas at 3% it is \$0.971, a percentage increase of only 8.7%. However, at 12% the present discounted value of a dollar receivable 10 years from now is \$0.322, whereas at 3% it is \$0.744, a percentage increase of 131%. That is, a decrease in the yield on an asset with one year to maturity from 12% to 3% increases the capital value by 8.7%, whereas the same decrease yield on asset identical in every way, save that it has 10 years to maturity, would increase its capital value by 131%. Even if we consider that only the first period discount rate for longer-term investments decreases (*i.e.*, if the portfolio substitution process has no effect on yields beyond the first period), the ratio of the present values of long term to short term investments increases, however minimal that rise may be, and therefore, a policy induced decrease in the short rate would disproportionately stimulate long term investments.

This is not the end of the matter for the transmission mechanism posited by Cowen is also problematic. He states (1997, 83): “An increase in economic volatility decreases the reliability of current information and induces entrepreneurs to shy away from long-term projects. . . . Entrepreneurs will be less inclined to make long-term commitments, and will be more inclined to move to short-term assets, such as cash or T-Bills. Inflation therefore may lead to an immediate contraction of long-term investment.” Again, this

is but ABCT, provided the volatility is the result of higher and more variable rates of inflation that occur as the unsustainable boom matures and turns into the crisis.

Cowen here becomes in effect a sort of Johnny one-note. If government inflates, this increases volatility; all the risk avoiding entrepreneurs pull in their horns, fearful of the long term, and pile on, instead, for the immediate run. However, if government *deflates*, this, too, will boost instability and precariousness. Given the same kind of business firms (we must hold *ceteris paribus* conditions, must we not?) this, *too*, will exacerbate unpredictability, to the same end: a rise in risk avoidance, which for Cowen automatically translates into short run investments at the cost of long run ones.²³

The shift from long-term to short-term investments in response either to inflation or to deflation is, for Cowen, but a possibility; investments could also shift from short term to long term, or, we assume, not shift at all, in response to inflation or to deflation. Were one to accept that point of view, the effects of monetary policy could not be expected to be systematic.²⁴ Rather, not just the details, but the very general course of the effects of monetary policy would depend upon the specifics of any situation. This would include the effects upon inflationary expectations and the resultant increase in risk, regardless of whether the policy were expansionary or contractionary.²⁵ Truly, then, the only possible way for the policy makers to achieve their goals would be either blind luck, or else to turn discretionary policy making over to Super Economist; i.e., Allen “the Man” Greenspan. Mere mortal economists would be unable, absent pure luck, to fathom the complexities of the real world sufficiently to gear policy to the desired ends.

²³ However, Cowen (1997, 82) contradicts himself on this matter when he says “. . . excessive entrepreneurial optimism does not imply a systematic distortion in the direction of excess long long-term investment. Entrepreneurs can be overly optimistic about the prospects for short-term investment as well, even in the presence of monetary inflation.”

²⁴ This harks back to the views of the German Historical School, against whom the early Austrians reacted. If there are no systematic effects of policy, there are no economic laws, only historical occurrences.

²⁵ There are two effects of monetary deflation on risk that tend to counteract each other: that felt first tends to increase risk as the change in the pattern and level of prices elevates uncertainty; that felt second, as prices fall and the risk of a given percentage forecast error declines, decreases risk. And, though the former tends to dominate when the deflation begins, the latter tends to govern as time passes. It should be noted that Cowen’s theory concerns a fiat monetary system. So too our analysis. In such a system, the optimal quantity of fiat money is the extant amount (Barnett and Block, 2004), save during a transition, were there to be one, to a commodity money. As the authorities are terrified by a price deflation and know how to defeat one (see Bernanke, 2002), actual price deflation seems to be ruled out. Therefore, and in any case, deflation and deflationary policies are used herein to refer to a decrease in price inflation and a slowing of the growth of money/credit. This seems to be in keeping with Cowen’s meanings.

But this is nonsense on stilts. Here we have two opposite effects: central bank imposed inflation, and then central bank imposed deflation. Thanks to the increased volatility of each, both of them pervert the structure of production in the identical direction. Such a situation would not, of course, render ABCT incorrect; only inapplicable to the real world. One way out of this quandary is to suppose that government's inflationary policy was *not* "volatile." Unless we define any and all statist interference with the economy in this manner,²⁶ this should be possible to accomplish. For example, it could be a gradual process, with no sharp spikes (in either direction.) Or, we may suppose that the central bank has long been inflating at the same steady rate,²⁷ and either continues to do so, or, at worst, alters this in teeny tiny steps. Another alternative is for the central bank to announce its nefarious plans in advance. As well, we could return to our heroic assumption of full information on the part of everyone. Any of these ways ought to put paid to Cowen's claim not that ABCT is incorrect, but that it is irrelevant to the real world, in that central bank inflation may not lengthen the structure of production, due to the fact that *any* of its actions are volatile, which, in turn, may lead to a truncation of the structure of production due to risk avoidance.

5 Confusion of inflation and savings

Neoclassical economists like Cowen have long sought after the Holy Grail of constants in economics. Previously thwarted and disappointed at all turns, Cowen now sees this in savings rates. We are informed by him (1997, 84) that according to ABCT,

Entrepreneurs confuse nominal money supply growth with increases in private saving... To the extent that private saving is either stable or predictable, the postulated monetary misperception will not occur. In the limit, a totally stable rate of private savings implies that entrepreneurs will never associate real interest rate moves with changes in the savings rate... Yet empirical macroeconomists traditionally have found savings to be one of the most stable variables over time...

²⁶ Something with which the present authors, we admit, have some sympathy.

²⁷ Perhaps they have adopted Friedman's (1997) "3% rule." See also Simons (1936). For a critique of the latter, see Block, 2002.

There are problems here. “Most stable” is a far cry from completely stable and thus totally predictable. Due to that little matter of human free will, there *can be* no such thing as a constant in economics (Mises, 1998, 55-56).

Assume, arguendo, per impossible, that the relation between savings and *income* was rigid, while not so with regard to the interest rate. In such a case, Cowen’s criticism would also be rendered impotent.

Again, Cowen focuses only on the cluster of error phenomenon, ignoring the subsidization aspect of inflationary monetary policy. *Even if* entrepreneurs were *never* fooled by compromised market signals, they would *still* have an incentive to pervert the structure of production, as we have seen, in response to governmental financial mismanagement.

Cowen (1997, 84) takes the position that “Unstable private saving implies that misperceptions of the savings rate will cause business cycles even in the absence of distortive monetary polity.” Not so, not so. The ABC refers to *systematic* variations in employment and productivity, etc., not to random changes. In Cowen’s lexicon, *there would always be* a business cycle, due to ordinary changes in market decision-making. But, surely, if the business cycle is *always* with us, and necessarily so, then there is no such thing as a business cycle in the first place. For words and phrases are supposed to distinguish presence or absence of their referent. This would no longer be the case for Cowen. It is as if he were to have said, “Human beings are always sick.” Then, we would have to distinguish two kinds of “sickness”: the ordinary type we now have, from this new overarching sickness. Similarly, if we are *always* in a business cycle, we shall have to distinguish real ones of the sort we have experienced in the past from this new type. It is unclear what intellectual progress is made by such grammatical legerdemain.

Moreover, though Cowen says that, as a matter of empirical fact, savings are stable, yet the savings rate in the U.S. has declined dramatically in recent decades,²⁸ and currently is a matter of great concern to economists.

Finally, Cowen (1997, 84) makes a critical mistake, one often made by some Austrians as well. Cowen purports to have a more realistic theory than ABCT. However, when he states that: “Entrepreneurs confuse nominal money supply growth with increases in

²⁸ See, for example the chart at: <http://research.stlouisfed.org/fred2/series/PSAVERT/112/Max>.

private savings,” and then goes on to examine the “plausibility of such a confusion,” he departs from the real world. It is true that Austrians do sometimes speak that way,²⁹ however, it is misleading. In fact, entrepreneurs do *not* think about “private savings” or “money supply growth.” Rather, the “signal extraction problem” arises because entrepreneurs when faced with lower interest rates cannot determine the cause. (And, as noted above, even if they could, some would still find it profitable to alter their behavior as per ABCT).

An important aspect of this is that interest rates are *not* determined by the interplay of saving and investment. This way of thinking arises because of macroeconomic; i.e. aggregative, analysis. Interest rates are set in credit markets and even in the absence of them, if there were no saving and investment at all, there could *still* be positive interest rates. For example, if there were no investment, but A and B engaged in a credit transaction the purpose of which was solely consumption by the borrower, there would be an interest rate set for the credit transaction. In this case there would be no investment and no saving, as the saving of the lender would be offset by the dissaving of the borrower, yet there would be an interest rate. If entrepreneurs were interested in the causes of a decline in interest rates they would not think in terms of the behavior of savers or of investors re interest rates,³⁰ rather they would think in terms of demanders and suppliers of credit, and they would not limit their thinking to the domestic private sector, but would include the governments at all levels, and foreign borrowers and lenders, both private and governmental, including supranational organizations as well.

So yes, there is a signal extraction problem in that investors (and other borrowers, for that matter) cannot discern whether lower interest rates are the result of a rise in saving, an increase in the money supply, or a combination of both. But more important, it is *irrelevant* to them, as individual decision makers, save in a world of perfect competition, efficient markets, and rational expectations. Neither is the entrepreneur, qua entrepreneur, a macroeconomist, nor is he interested in macroeconomics, save as macroeconomic phenomena affect the profitability of his current ventures and/or the expected profitability of future projects. So what macroeconomic phenomena are of im-

²⁹ For example, Rothbard (1963,18): “Businessmen, in short, are misled by bank inflation into believing that the supply of saved funds is greater than it really is.”

³⁰ This is not to suggest that entrepreneurs are not concerned with the investments of their competitors or suppliers, but that preoccupation is not with respect to the effects of such behavior on interest rates.

portance to him? Not “the” interest rate or interest rates in general, but the particular interest rate(s) he must pay if he wishes to borrow. Not “the” exchange rate or exchange rates in general, but specific exchange rates of currencies he exchanges, if any. Not “the” wage rate or wage rates in general, but the precise wage rate(s) he must pay. Not some economy-wide measure of productivity and changes thereof, but the productivity, and changes, if any, the productivity of his own operations.

We suspect that Cowen, himself, in deciding whether to finance a new, or refinance his old, residence, or for that matter, investments in other real estate, because of a lowered interest rate does not take into consideration the reason(s) for the lowered rate. Is it possible that Cowen, himself, with his understanding of macroeconomics and thus no signal extraction problem, yet alters his behavior when interest rates are reduced because of an increase in the supply of money/credit?

6 Confusion of inflation and investment

Cowen’s next attack on ABCT is that it conflates shifts in supply (savings) with demand (investment). He (1997, 85) states:

The Austrian claim assumes that entrepreneurs attribute a lower real interest rate to a shift in the supply curve for loanable funds rather than to a shift in the demand curve. The Austrian literature, however, does not address why one kind of confusion might be more likely than the other. At least three factors may lower real interest rates: higher non-inflationary savings, inflationary injections into the loanable funds market, and declines in investment demand. The Austrian claim implicitly assumes entrepreneurs confuse the first and second of these causes, and does not consider the alternative possibility of a confusion between the second and third causes.

There are several difficulties here. Consider that there are four sets of interest rates that are worthy of concern:

1. Nominal market rates of interest: actual rates of interest at which credit transactions take place. All parties to a credit transaction face the same nominal market rates of interest

2. Real market rates of interest: nominal market rates of interest adjusted for expectations of inflation/deflation. Parties to a credit transaction face the same real market rates of interest only if they have the same expectations about inflation/deflation.
3. Nominal natural rates of interest: nominal market rates of interest that would exist absent governmental intervention re the stock of money and supplies of credit.
4. Real natural rates of interest: nominal natural rates of interest adjusted for expectations of inflation/deflation.

Note: Because expectations of inflation are the same whether we are considering market or natural rates, real natural rates differ from nominal natural rates by the same amounts as real market rates differ from nominal market rates.

Artificial increases in credit result in lower real and nominal market interest rates, not natural ones, creating a divergence between them. It is this divergence between the market rates on the one hand, and the natural rates on the other, that causes the problem.

More basic and more important, there is an *identity* between real savings and real investment (Barnett and Block, unpublished).³¹ Untold confusion has arisen in economics because of the failure to distinguish between real and financial savings and/or investment. That Cowen does not appreciate this merely demonstrates that he is in thrall to an “academic scribbler”³² of the past, Keynes. For this latter worthy, the two are not at all connected. But this is not at all the case.

The problem with Cowen’s analysis of a shift to the left of the “investment-demand curve” in the loanable-funds analysis he uses, has to do with the basics of human action. It is easy to understand why either the “supply curve of saving,” and/or the supply of money/credit, in the context of “loanable-funds-market” analysis might shift outward/downward. The former would stem from an increase in the strength of preferences by consumers given the same income or a rise in income with the same strength of preferences, or a boost in both; the latter would be the result of expansionary money/credit

³¹ Untold confusion has arisen in economics because of the failure to distinguish between real and financial savings and/or investment.

³² Keynes (1936, p. 383) stated: “Practical men, who believe themselves to be quite exempt from intellectual influences, are usually the slaves of some defunct economist. Madmen in authority, who hear voices in the air, are distilling their frenzy from some academic scribbler of a few years back.”

policy. In either case, thymology can give reasons for such behavior. Consider, on the other hand, why “demand for investment” in the context of “loanable-funds-market” analysis might shift inward/downward. There are no preferences that directly affect it. Rather, such a change would always be induced. It would not be an exogenous alteration but, rather, endogenous. Therefore, the burden is on Cowen to explain the causes of the downward/inward shift – it cannot merely be posited. This smacks of Keynes’ “animal spirits.” In fact, changes in investment are induced by a prior change in some other variable; they cannot be as, some changes in consumption are, direct consequences of altered preferences, though, of course, they could be indirect consequences of changed preferences. As we teach our students, the demand for resources is a derived demand; we do not demand resources, *qua* resources, for themselves, but for how they can assist in the production, directly or indirectly, of consumers’ goods.

A shift to the supply curve of savings, though it does cause a reallocation of resources, does not cause a misallocation of resources. The same would be true if the demand curve for investment shifted to the left. Though in both cases, the use of supply and demand is incorrect. There is no supply of saving or demand for investment. There are demands for, and supplies of, various types of capital goods. These demands constitute “the” real demand for investment and these supplies constitute “the” real supply of investment. But in those markets the price is not “the” interest rate, but, rather, the price of the specific good; e.g., \$x/ton of steel or \$Z/welding machine. Though, in fact, it is the specific acts of producing new capital goods (and durable consumers’ goods) that, at one and the same time, constitute both saving and investment. The markets where these goods are exchanged are just that – markets; i.e., processes in which goods are exchanged – in these cases, new capital goods. Or, if one is considering “saving” in the context of “loanable funds market” analysis, then the supply of saving is about financial saving. In that case, the supply of saving is but a demand for non-money financial assets, whether debt (including deposit ‘receipts’ or other forms of “IOUs” such as notes or bonds) or equity certificates. These are more accurately portrayed as markets for financial assets; i.e., the demand and supply of financial assets, than as markets for loanable funds. In any case, it is in these markets for financial assets, including deposits, that interest rates emerge as the exchange ratios of such transactions. Thus, as per above, interest rates are not determined by saving and investment. This is not to say that that plans to produce consumers’ goods

(both durable and non-durable, including services and labor, and capital goods) as well as plans to consume and supply or withhold resources, including natural resources, do not affect interest rates; they do. It is just that these rates are initially set in markets for financial assets. Moreover, other factors enter into the equation as well.

7 Real vs. nominal rates of interest

Cowen (1997) makes two claims in this section, one of which is correctly attributed to the praxeological school, and the second not. He finds no fault with the first, but does with regard to the second. Cowen is here guilty of setting up a straw man, and then (partially, as we will see below) knocking it down. According to Cowen (1997, 88, material in brackets inserted by present authors): “First, the lower real rate [of interest] increases the relative present value of long-term projects. Second, the lower real rate provides a signal about the composition of future demands. In other words, entrepreneurs expect demand to be high for the outputs of long-term projects, and expect demand to be relatively low for the outputs of shorter-term projects.”

It cannot be denied both that Austrians make the first of these two claims, and that it is correct. Indeed, this is an essential aspect of ABCT. Increased investment flows to interest sensitive products³³ in response to a lower real rate of interest, precisely because the latter has a differential effect on long and short term investments, raising the value of both, but disproportionately the former. As Cowen does not call this into question, we move to his second contention.

For one thing, it is by no means clear that this is a legitimate “Austrian claim” (1997, 88). A cite to the praxeological literature on his part would have been very helpful at this point. For another, the phrase “outputs of long-term projects” is ambiguous. Is the “long term project” a consumer durable, such as a house, piano or car, or is it an investment good, such as a cement factory or steel mill? There are several reasons for making this inquiry. First, in some cases it takes a long time to produce a consumer good that is consumed very quickly. For example, some 5 years of growth and development of a coffee tree must initially take place before the product is ready for market (<http://kaffee.netfirms.com/Coffee/CoffeeProduction.html>), after which the time taken

³³ These are traditionally called the higher orders of the structure of production.

to consume it is brief. In other cases, the production time can be trivial, e.g., picking up a gold nugget right off the ground, but that self same consumer good might serve for decades or even centuries. Second, our author (1997, 88) also makes use of the phrase “long term outputs”: “Lower real interest rates will not induce entrepreneurs to conclude that demand for long-term outputs has risen...” What, then, is the relationship between “outputs of long term projects” on the one hand and “long term outputs” on the other? Synonyms, possibly? We are vouchsafed no clarification. Nor does his (1997, 88) discussion of consumer durables shed any light on this mystery: “Real interest rates do have significant predictive power for the demand for debt-financed consumer durables, such as homes and automobiles.” Rather, this opens up even more mischaracterizations of the praxeological position. For if there is one thing that Austrians *eschew* it is all things related to prediction, “predictive power” certainly included. Says Mises (1998, 117-118) on this issue:

Praxeological knowledge makes it possible to predict with apodictic certainty the outcome of various modes of action. But, of course, such prediction can never imply anything regarding quantitative matters. Quantitative problems are in the field of human action open to no other elucidation than that by understanding.

We can predict, as will be shown later, that – other things being equal – a fall in the demand for *a* will result in a drop in the price of *a*. But we cannot predict the extent of this drop. This question can be answered only by understanding.

The fundamental deficiency implied in every quantitative approach to economic problems consists in the neglect of the fact that there are no constant relations between what are called economic dimensions. There is neither constancy nor continuity in the valuations and in the formation of exchange ratios between various commodities. Every new datum brings about a reshuffling of the whole price structure. Understanding, by trying to grasp what is going on in the minds of the men concerned, can approach the problem of forecasting future conditions. We may call its methods unsatisfactory and the positivists may arrogantly scorn it. But such arbitrary judgments must not and cannot obscure the fact that understanding is the only appropriate method of dealing with the uncertainty of future conditions.

Here are two statements of Cowen (1997, 88):

The Austrian claim requires that entrepreneurs use interest rates to forecast the content of consumer demand. Following a decline in real interest rates, long-term

investment rises for two distinct reasons, according to the Austrian claim. First, the lower real rate [of interest] increases the relative present value of long-term projects. Second, the lower real rate provides a signal about the composition of future demands. In other words, entrepreneurs expect demand to be high for the outputs of long-term projects, and expect demand to be relatively low for the outputs of shorter-term projects.

And:

Lower real interest rates will not induce entrepreneurs to conclude that demand for long-term outputs has risen. . .

Here is our reaction. First, Austrians do not claim that entrepreneurs use interest rates to forecast consumer demand. As is explained below, a decline in interest rates causes changes in consumers' demands in the present to which entrepreneurs respond by increasing the quantities supplied of those goods experiencing the increased current demand. Second, as to using interest rates to forecast consumers' future demands, the analysis of this point requires development of some other matters.

Cowen uses the terms, "long-term projects," "the outputs of long-term projects," "long-term outputs," and "the outputs of shorter-term projects." These phrases are problematical, to say the least. He does not define them, yet their meanings are, at best, ambiguous. What is a "long-term project?" A "shorter-term project?" Because he refers to "the outputs of long-term projects" and "the outputs of shorter-term projects," and outputs result from production processes, it would seem that "long term projects" and "short term projects" are production process that take, from beginning to end, a long time or short time, respectively. And, from the context, "long-term outputs" seems to be synonymous with "the outputs of long-term projects." The only other meaning that may reasonably be assigned to the former term is "durable goods," and that certainly cannot also be the meaning of "the outputs of long-term projects," as many outputs of long-term projects are not very durable at all; e.g., gasoline. Moreover, the term "durable goods" is a commonplace in economics that he could have been expected to use had that been his intended meaning. So we assume that the two terms are synonyms, and ask what they mean. As "the outputs of long-term projects" is a less confusing term, we shall examine

it. We ask, then, what do the outputs of different, long-term projects, on the one hand, and of different, shorter-term projects on the other, necessarily have in common? More specifically, what common characteristics do the former have, and what common characteristics do the latter have, that causes the demands for the former to be more responsive to changes in real interest rates than the demands for the latter? In fact, other than the length of the production processes themselves, there does not seem to be any common characteristics among members of either group. And, although the supplies of the goods in the different groups may respond differently to changes in real interest rate, there is no reason for their demands to do so.

Therefore, a far better term to use than “long-term projects” is “interest-rate-sensitive goods.” And second, as we shall see below, it is the demand for interest-rate-sensitive goods, not the outputs of shorter-term projects, that entrepreneurs expect to increase relatively (not necessarily be high) and the demand for interest-rate-insensitive goods, not the outputs of shorter-term projects) that they expect to decrease (not necessarily be low).

Therefore, in order to analyze these statements we must first come to grips with exactly which types of goods are the ones for which the demand is stimulated by declines in real interest rates. There are three types of such goods, all of which may be referred to as interest-rate-sensitive goods.³⁴ These are goods the quantity demanded of which is relatively responsive to changes in the relevant interest rates. There are two ways that interest rates affect the demand for such goods, one direct and the other indirect. In the former, the demand for these goods increases when interest rates decrease, because their future values are discounted less and thus their present values increase. In the latter, the demand for these goods rises because the price of a complementary good, credit, falls.

There are, then, three characteristics of a good, any one of which may be sufficient to make it interest-rate sensitive. The first two are both time aspects, which are a matter of degree. These two affect demand directly. The third is “credit complementarity,” which is also a matter of degree; i.e., the extent to which credit is necessary (or at least the optimal) method of financing purchases of a specific good. Every good may be considered to have two time aspects, which we, designate PT (for period of time) and DR (for durability). Consider, first, capital goods. The value of an individual capital good is tied up in the

³⁴ The more interest-rate-elastic is the demand for a good, the greater is its interest-rate sensitivity.

production process until it is realized in the form of sale to the consumer of the consumer good(s) it was used, directly or indirectly, to produce. This value depends upon the period of time from the application of the capital good in the production, directly or indirectly, of a specific individual consumer good, until that specific individual consumer good is sold to the consumer. This is the PT aspect. The value of the same capital good also depends upon the time period during which it contributes, directly or indirectly, to the production of different individual consumers' goods. This is the DR aspect.

Consider, for example, a stick of dynamite used on 1/1/2005 to blast free a piece of marble which is used solely for the production of one sculpture. This sculpture requires five years of work by the sculptor, and ends up being sold to a collector on 1/1/2010. Note that all of the "work" done by the capital good (the dynamite) was done instantaneously on 1/1/2005, but the value of that work was not realized until 1/1/2010; therefore that value was tied up in the production process for five years; i.e., PT is 5 years. And, as the dynamite contributed to the production of only one consumers' good, its durability aspect may be said to be zero years; i.e. DR is 0 years.

Next, consider a cash register used at the point of sale at a retail store. In this case, the capital good does its "work" with respect to any specific individual consumer good virtually instantaneously, as did the dynamite, but now, unlike in the case of the dynamite, this "work" is tied up in the production of a specific individual consumer good only momentarily; i.e., for the brief time necessary to consummate the transaction. Thus its period of time aspect is virtually zero; i.e., PT is 0 years. However, and unlike the case of the dynamite, which could be used but once, and contributed to the production of but one consumers' good, the cash register can be used over and over again in the production process; i.e., in the production³⁵ of many individual consumer goods. If the cash register is expected to be used for, say, 10 years, then its durability aspect is 10 years; i.e., DR is 10 years.

This example has contrasted the extremes; that is, two capital goods, for each of which one of the time aspects is zero or nearly so). Of course, for a vast number of capital goods, neither time aspect is zero.

³⁵ In our view, selling the good (or for that matter marketing it) is as much "production" of it as what is usually considered manufacturing. That is, the cash register is as much a part of producing as a sweater as is the cotton that goes into it, or the sewing machine that assembles it. See on this Kirzner (1973).

The greater is PT, the earlier is entry of the capital good into the production process. Because there is not necessarily a one-to-one correlation between steps – or, stages – in a production process and PT, it is incorrect to say that as between two capital goods, one with a larger, and one with a smaller, PT, the former is of higher order than the latter.³⁶ However, as between two such goods, one with a larger, and one with a smaller, DR, it is *correct* to say that the former is more durable than the latter.³⁷ We may also consider that a capital good has a composite time aspect, T, such that T depends on both DR and PT in such fashion that, *ceteris paribus*, the greater is either (or both), the greater is T; i.e., the earlier a capital good enters into the production process and/or the more durable it is, the larger is T.

The time aspect is important for consumer goods also. However, in their case there is only one time aspect, the durable (DR). That is, as consumer goods are intended to satisfy wants directly, the only time element of concern is their durability. Thus for consumer goods, the composite time aspect, T, depends solely on DR, and is such that the greater is DR the greater is T.

In addition to the time aspects, there is another factor that makes a good sensitive to interest rates. These are goods, whether capital or consumers', the purchases of which are financed by credit. Although these are usually goods that are relatively expensive, they need not be. Moreover, although most purchases of goods with large Ts are financed by means of credit, the purchases of some purchases of goods with small Ts are also financed by means of credit; e.g., some people use credit to finance vacations.

And, before we consider Cowen's second claim another thing that must be examined is the process of by which the supply of money/credit is expanded. The expansion pro-

³⁶ A possible objection: This does not sound right. Surely, the bigger the PT, the earlier the stage of production? The logic here is that the orders of goods (or stages of production) are really ordinal; i.e., first stage/order, second stage/order, etc, whereas the time period is cardinal.

³⁷ Another possible objection: This sounds correct, alright, but too correct: that is, merely tautological. Our reply: in the standard ABCT literature there is no discussion of the durability issue, only of the time period/stages (orders) issue. According to Barnett and Block (Forthcoming, B) the stages/orders approach is invalid because what is of interest is interest rate sensitivity, which is related to time (cardinal) but not stages/orders (ordinal). And there is no necessary consistency between stages/orders and time; i.e., one process might involve many temporally short stages/orders and another a few lengthy stages/orders. Interest rate sensitivity is also affected by durability (cardinal). However, in this case there is no parallel ordinal setup; i.e., nothing similar to stages/orders.

cess begins when the Fed buys something, say 90-day T-bills,³⁸ in the “open market,” bidding up the price and lowering the yield as it does so. This sets in motion what may be viewed as two different paths of activity.

The first is the direct, portfolio-adjustment process. The sellers of the T-bills receive deposits; i.e., money, at commercial banks.³⁹ These sellers then find themselves with “too much money;” a larger share of their assets held in the form of deposit/money than they think best. As they look for more desirable, substitute, assets for this money they are most likely to look to other (than 90-day T-bills) short-term, low-risk, securities, to replace the ones they sold to the FED. Some may prefer to extend the maturity rather than take on higher (default) risk. They might purchase, e.g., 180-day T-bills. Others, with different preferences might buy high-grade, 90-day commercial paper, instead. Yet others may prefer neither to accept greater default risk, nor to extend the maturity of their portfolios. In such cases, they may prefer to take on some exchange risk, buying say 90-day £-denominated securities issued by the U.K. In any case, as the portfolio-adjustment process proceeds, it affects securities that are more and more risky, and that have longer and longer terms to maturity.⁴⁰ As these securities are purchased, their prices are bid up and their yields fall. As to foreign securities, in order to purchase them, the appropriate foreign currency must first be purchased.^{41,42} And, some of the excess

³⁸ It is true that the Fed is not constrained to operate in the short end of term structure, but that is its standard operating procedure. And, this assumption is conservative re the ABCT, in that operations in the longer end of the term structure have a more direct and greater effect on long-term yields.

³⁹ Thus, the FED has “monetized” part of the U.S. Government’s debt.

⁴⁰ The term to maturity of a financial security or, more broadly, the economic life of any good, resource, or asset, is subjective as it depends on the estimation of the individual concerned – the owner and prospective owners. However, some financial assets also have an objective-in-some-sense term-to-maturity; e.g., a security that purports to mature in 90 days. Equities, for accounting purposes, are treated as perpetuities, and therefore as long-term securities; however, as with any other thing of economic value, from the economic point of view, equities may be considered by relevant parties to be short term. This is not unrelated to Keynes’ (1936) point that that from an aggregative point of view an economy’s liquidity is fixed in the short run and changes only slowly over time, but that individuals are concerned with the liquidity of their own portfolios, not that of the “social portfolio.” Thus attempts by individuals to increase their own liquidity by selling securities and holding “money” do not alter the social liquidity, but only drive down the prices, an increase the yields, of such assets.

⁴¹ We ignore, here, American depository receipts, though a consideration of them would not alter our analysis.

⁴² Re the international aspects, three possibilities arise. First, the U.S. government might try to hold the exchange rate fixed. In that case, it would merely be offsetting part of its expansion of the supply of money/credit. Moreover, it would, in that case be maintaining the dollar in an overvalued condition re the relevant foreign currencies, which would lead to continuing balance of payments deficits, continuing

money will, later, if not sooner, spill over into markets for real assets, especially real estate, bidding up the prices and lowering the yields on these assets and goods, as well. Therefore, we see that the inflationary effects of expansive money/credit policies affect long-term financial and real assets, as well as short-term financial assets and goods.⁴³

surpluses of U.S. dollar (USD) in the foreign exchange markets, and a continuing need to purchase USD in those markets, if the exchange rate is to remain fixed. Second, one or more foreign governments may wish to maintain the USD in an overvalued condition. The usual reason for this is that governments follow mercantilist policies that go by the name of “export led development,” as they try to grow their domestic economies through production of goods for sale, with those sales stimulated by “under pricing” their goods on world markets by means of their undervalued currencies. In such cases, the foreign governments must buy up the surplus dollars in the foreign exchange markets. Essentially, there are four ways they can do this: 1) inflate their own money supplies and use the new money to buy the USD; 2) borrow some of their own domestic money and use it to buy the USD; 3) raise tax collections, either by increases in the tax base, or by increasing tax rates (It is most likely that such interventionist regimes are in the inelastic range of the tax revenue curve; i.e., that range where an increase in the tax-rate “price” would lead to a less than proportional decline the tax-base “quantity” and, thus tax revenues would increase as the rate was raised.). Nevertheless, for a variety of reasons, they are most unlikely to lower rates in an attempt to raise revenues, and thus this method of raising funds for the purpose of intervening in the foreign exchange market is most unlikely to succeed; and, 4) engage in exchange controls. Each of these methods is undesirable in terms of their longer-term, if not also, the short-term, effects on their domestic economies.

⁴³ Let us discuss the concept of inflation. Most think of price inflation only in terms of the prices and, where appropriate, the rental rates, whether actual or imputed, of consumers’ goods and services, and, perhaps some also include the prices of goods-in-process and newly produced capital goods. However, such concepts exclude a vast number of prices involving immense quantities of other goods that are relevant for understanding economics, especially business cycles. These other prices include exchange rates, the prices of foreign currencies. When the government in conjunction with the banking system expands the supply of money/credit, it creates a situation in which there is “too much money.” As is well understood, when individuals have too much of something they try to get rid of the excess, normally by exchanging it for something of which they have a dearth. In the case of excess money, this means spending it. But as the quantity of anything increases, its per-unit value decreases relatively to what it otherwise would have been. And, as we know from basic economic theory, the money will be spent on different goods until its value at the margin tends to be the same relative to every good. Now this will not happen immediately; once the structure of prices has been disturbed by the injection of new money, it will take some time to reestablish a structure appropriate to the new quantity of money. Nevertheless this will tend to happen. In fact, usually when the injections of new money begin the first markets affected are those for financial assets, including foreign moneys. While the prices of these assets are bid up in the initial stages of a monetary inflation, it usually takes some time before the prices of real assets and goods begin to rise in any significant way. This early period is not seen by most as inflationary. In fact, most take the increased prices of financial assets as a positive sign about the condition and direction of the economy, not realizing that these are inflationary price increases. They are price-inflationary in that they are higher prices for the same financial assets; these price increases would not be price-inflationary only if the value of these financial assets had risen for some “legitimate” way; e.g., the risk involved re future cash flows decreased or future cash flows, adjusted for expected inflation, were expected to increase. As “printing” money cannot increase the wealth of a society; else if it could we could end poverty and enrich everyone very quickly and virtually costlessly, there is no reason for the value of the claims to that wealth; i.e., the financial assets, to increase in value. Therefore, the increases in their prices, taken as a whole, are unwarranted; i.e.,

It should also be noted that the quantities supplied of longer-term financial assets in response to increases in the demand tend to respond more slowly than do the quantities supplied of shorter-term financial assets, goods, resources, and real assets, in response to increases the demand for them.

The second occurs as banks invest the excess reserves created in the initial monetization of U.S. governmental debt. If the banks invest by purchasing U.S. governmental securities or preexisting private sector securities, they pay for such purchases by increasing the deposits/money of the sellers; i.e., they do so as did the Fed monetize part of the U.S. Government's debt, or in the case of private securities, the banks monetized private sector debt. This would then become part of; i.e., expand, the portfolio-adjustment process discussed supra. If instead, they buy new governmental or private sector securities, that are being sold in order to refinance existing and preexisting debt, whether maturing or not, then the effects will be felt in the portfolio-adjustment process discussed above. However, to the extent that the preexisting securities are not owned by the banks and are quite similar in characteristics to the new securities, as is likely to be the case, the effects on the portfolio-adjustment process are likely to be trivial. If, however, the banks own the preexisting securities, this will have virtually no effect on the expansion process, as it amounts merely to substituting the new securities for the preexisting ones in the banks' portfolios, without affecting the quantities their excess reserves. The banks' investments have a more direct effect on the economy when they take the form of the purchase of newly-created governmental or private-sector securities that are not used to finance the purchase of preexisting securities. In the case in which it is governmental securities that are purchased, the newly created money will be used to finance the government's current deficit. In that eventuality, there is no way to know which goods would not have been purchased by the government had it avoided deficit financing by reducing its purchases of

price-inflationary. Similarly, when the prices of foreign monies are bid up, that also is price inflationary as we must pay more for the same assets. The only way that would not be price inflationary would be if the assets, the foreign monies, became more valuable; i.e., if the prices of foreign goods and assets denominated in terms of foreign monies fell so that even though we would have to pay a higher price per unit of the foreign money each unit of that money would be able to buy more goods and assets, such that the net effect would be a wash. Only at some remove in time does the excess money begin to have a significant effect in terms of the prices of (domestic) real assets and goods. A useful metaphor is that money is like water in that so as water seeks its own level, in all channels through which it flows, so the value of money of money seeks its own level in (spending) channels through which it flows.

The upshot is that when we understand price inflations to be a phenomena that affect the prices of *everything*, we realize that they commence at the same time that their causes, monetary inflations.

goods, or what goods would not have been purchased by the private sector had it avoided deficit financing by reducing transfer payments or increasing tax revenues.

It is a different matter when it comes to banks investing their excess reserves by creating new money and using it to purchase newly-created, private-sector securities. In that case as the process of money/credit creation continues until there are no, or virtually no, excess reserves, we may make reasonable forecasts of how the new money will affect, directly or indirectly, the structure of purchases in the economy, and thus the course of changes in production.

With this introduction, let us now consider Cowen's claims. Regarding the first, he is correct when he says, "... the lower real rate (of interest) increases the relative present value of long-term projects," provided by long term projects he means not just those with relatively large PTs, but, rather, all projects with relatively large Ts, including consumers' goods whose large Ts are the consequence of their DRs. We must point out that although these provisos clarify his statement, it is still incomplete as it fails to account for those goods that are interest-rate-sensitive because credit is a complement in their purchase.

The problems with his second claim, "... the lower real rate provides a signal about the composition of future demands. In other words, entrepreneurs expect demand to be high for the outputs of long-term projects, and expect demand to be relatively low for the outputs of shorter-term projects" are much more serious."

Austrians do not claim that lower real interest rates provide signals about the composition of [consumers'] *future* demands. Rather, lower real interest rates cause changes in consumers' *current* demands. Specifically, demands for consumers' goods with high values of T increase, both absolutely and relative to those with low T values. In particular, the demands for built-to-order, new, single-family residences rise. And, as is well understood, that boosts the demands for such "big-ticket" items as major house-hold appliances and furniture. Moreover, the demands for these latter types of goods increase independently of the rise in demands for new, single-family residences, as the lower real interest rates induce some people replace older furniture and appliances. Then there is the issue of personal transportation. The lower real interest rates also induce some people to purchase new vehicles. These types of goods all have high T values. Furthermore, to the extent that the expansion of money/credit lowers the real interest rates on revolving

credit, debt service charges decrease. This induces some consumers to borrow additional money, as they can now afford more loans in terms of their debt service loads. In addition to the aforementioned types of consumers' goods, this increased purchasing capacity may be used to buy various other goods. Many, perhaps even most, of these items have low T values, but that is irrelevant in that entrepreneurs respond to the actual increases in demands, both for those goods with low, and those goods with high, T values. Businessmen do not have to use changes in real interest rates to forecast alterations in the composition of demands for consumers' goods. What they must do is respond to the changes in demand consequent on the lowered real interest rates.⁴⁴

Now consider demands for some new capital goods with high values of T , say office buildings. An entrepreneur does not have to know that lower interest rates suggest increased future demands for the relevant consumers' goods; i.e., the consumers' goods to the production of which the workers in the office building will contribute. In fact, different firms with offices in the same building may be involved in different industries spanning the entire time structure of production for early to late entry in the production processes of the economy. Even individual firms may be engaged in activities that range from early entry to late. Yet none of that need concern the entrepreneur. He merely needs to recalculate the present value of his ownership interest, assuming the same expected net cash flows, but using whatever lower discount rate he thinks appropriate given the decline in real interest rates. Of course, he may wish to increase his projected net cash flows as the economy would be expanding. Only if he thought the lower real interest rates would, for some reason, cause a decrease in his net cash flows would he expect the present value of his office building to decrease, and then only if the expected decrease in net cash flows were expected were of sufficient magnitude to offset the decrease in his discount rate. But what is true of office buildings is also the case with other capital goods such as industrial and commercial real estate, including investor owned residential properties,⁴⁵

⁴⁴ And, with respect to the crises and busts, the role played the expansion of the quantity supplied of these high- T -value, consumers' goods, is that when real interest rates rise, demands for these types of goods decline, both absolutely and relative to consumers' goods with low T values. Moreover, increased debt-service expenses cause a decline in the demands for consumers' goods in general.

⁴⁵ Although apartment buildings are viewed as capital goods by their landlords, yet the apartments themselves are viewed as consumers' goods by their renters, and, given that the renters enjoy some of the rights of owners – the rights to use and exclude others from using – it is more correct to refer to both the renters and landlords as owners of different sticks in the bundle of rights.

especially multi-family apartment and condominium buildings and developments, and “plant,” in general, as well as much equipment. That is, without any change in expected net cash flows, the present value of plants, in general, and much equipment, increases. Of course, the present values increase even more if the lowered real interest rates lead to forecasts of rising net cash flows. These enhancements in present values stimulate demands for more plant and equipment, as projects that formerly were seen as marginal, now appear profitable.

What of entrepreneurs not given to present values analysis? Many, particularly smaller, entrepreneurs may merely view interest as an “expense of doing business.” For them, the lower real interest rates are seen to reduce their interest expenses of financing production; e.g., payrolls and inventories, thereby increasing profit margins, and inducing them to *expand* operations. Some of them will be induced to expand operations by purchasing new plant and equipment; i.e., goods with high values of T , now viewed as cheaper because the interest expense involved in financing such purchases would be lower. This effect is probably quite large when it comes to contractors building residential properties on speculation.

We see then, that ABCT neither claims, nor relies upon, interest rate signals re future demands. Rather this theory depends upon claims that changes in interest rates affect current demands, and that there is a pattern to these effects. That is, the demands for goods, whether consumers’ or capital, with relatively high values of T increase, both absolutely and relative to goods with lower values of T .

Speaking of misunderstandings of Austrianism, this is only the tip of the iceberg for our author. Consider in this regard the following (Cowen, 1997, 88-90, emphasis added by present authors): “The Austrian claim postulates not only that the interest-elasticity of investment decisions is *high*...” “The Austrian claim ... specifies ... that consumption demand ... will be *strong* in the relatively distant future.” “The Austrian claim ... requires that *significant* changes in the intertemporal distribution of consumption be correlated with observable changes in the real interest rate. For a change in the real interest rate to *significantly* alter expected project profitability through demand side effects, interest rate changes must imply relatively *large* shifts in expected demand across time. If the real interest rate is low today, consumption in some future period must then be *especially high*. This *prediction* ...” “Success of the Austrian claim ... requires that signals about

aggregate expenditure flows play a large role in determining the success of investment forecasts. . .”

In all of these cases Cowen interprets Austrians making definitive statements about the *strength* of various effects; e.g., “high,” “strong,” “significant” and “large role.” But for this school of thought there are no constants in human action. Economic actors have free will, and are thus able to choose *differently* each time, even when confronted with similar, or, if possible, *identical* data. Austrians *reject* transitivity, as some sort of handcuff for human action. A man may prefer $A > B$ and $B > C$, but when faced with options A and C, pick the latter. Irrational? Not at all. For the first choice, between A and B took place at time T1, between B and C at time T2, and A versus C at time T3. Only the decision maker may say that he prefers A to B, and thus the opportunity cost of A is the subjective value of B to the decision maker. The rest of the world only knows that the decision maker prefers A to every other alternative *he* perceived, some of which might not have been perceived by anyone else, and other “alternatives” perceived by others may not have been perceived by the decision maker. People can, and do, change their minds; they can make different decisions at different points of time, even, sometimes, when the time span between them is very short.⁴⁶ And, a similar analysis applies to *prediction*. Free will, also, renders impossible prediction of the future. It cannot be denied, of course, that entrepreneurs engage in such acts every day; indeed, they sink or swim on the basis of how well they acquit themselves of such tasks. Those who do so as economists, cannot be Austrians. Cowen would do well to consider Mises (1957), where he explains the difference between theory and history and the use made by Austrian economists of supplementary assumptions. We can legitimately use *pattern prediction*; i.e., qualitative, not quantitative, predictions based on theory and the *ceteris paribus* assumption.

As Austrian economists we can for example predict, with the assumption (explicit or implicit of *ceteris paribus*), that if gasoline prices go to \$5.00/gallon, the volume sold in the U.S will decline, though by how much we can have no idea, although we could use history, *verstehen*, experience, to help us get some idea of a ball park range.

⁴⁶ For example, Joe gets up at 6:00 a.m. and prefers exercising to showering; at 6:15 a.m., he prefers showering to eating breakfast; and at 6:30 a.m. he prefers eating breakfast to exercising. Lo and behold, transitive preferences in the space of 1/2 hour. So much for indifference curves, etc.

As Mises (1998, 117-118) stated:

Praxeological knowledge makes it possible to predict with apodictic certainty the outcome of various modes of action. But, of course, such prediction can never imply anything regarding quantitative matters. Quantitative problems are in the field of human action open to no other elucidation than that by understanding.

We can predict, as will be shown later, that – other things being equal – a fall in the demand for *a* will result in a drop in the price of *a*. But we cannot predict the extent of this drop. This question can be answered only by understanding.

The fundamental deficiency implied in every quantitative approach to economic problems consists in the neglect of the fact that there are no constant relations between what are called economic dimensions. There is neither constancy nor continuity in the valuations and in the formation of exchange ratios between various commodities. Every new datum brings about a reshuffling of the whole price structure. Understanding, by trying to grasp what is going on in the minds of the men concerned, can approach the problem of forecasting future conditions. We may call its methods unsatisfactory and the positivists may arrogantly scorn it. But such arbitrary judgments must not and cannot obscure the fact that understanding is the only appropriate method of dealing with the uncertainty of future conditions.

Cowen (1997, 89) makes the claim that “Real interest rates do not signal which particular goods will be in high demand at a given point in time.” But no Austrian worthy of his salt ever claimed that interest rate changes could distinguish between demand for peas and carrots, or canoes and row-boats. However, when it comes to consumer durables such as houses, cars, violins, versus immediately used consumer goods such as coffee, orange juice, tissue paper, the interest rate most certainly does have differential implications. A higher rate favors the latter, and a lower, the former.

Cowen (1997, 89) characterizes it as “ironic” that the Austrians, who eschew aggregation, and criticize it when it appears in other macroeconomic theories, are themselves guilty of this sin in ABCT. This is because “. . . within the Austrian theory itself, the real interest rate, at most, signals the distribution of aggregate demand over time; the real interest rate does not signal how that demand will be distributed across particular products once that time period arrives.” But there is aggregation, and then there is aggregation. The mainstream economics profession sees capital as a homogeneous blob. Neoclassical economists even have a name (or at any rate a letter) for it, all of it: “K.” For Austrians,

in very sharp contrast, capital goods are heterogeneous, consisting of fixed “plant and equipment” of various degrees of specificity and also of goods-in-process of varying specific kinds. For Cowen, unless an interest rate change has different implications for, say, steel than it has for coal, or tea vis-à-vis potatoes, the school of thought engaging in the analysis is guilty of excessive aggregation. This only illustrates once again that Austrianism constitutes a “golden mean” between extremist theories that lie on both sides of it (Garrison, 1982.)

Cowen (1997, 90-91, fn. included) states:

To the extent investors have naïve expectations, they do not fully anticipate the forthcoming effects of money supply growth. Incipient price inflation will not raise nominal interest rates through a Fisher effect. Future price increases will arrive unexpectedly, and *ex post* real rates of interest will be lower than currently observed nominal rates would indicate. In other words, entrepreneurs will have overestimated forthcoming real rates of interest on borrowing. *Ex post* real borrowing rates will be especially low, perhaps even negative.

Investments financed with medium- to long-term debt will reap an unexpected windfall from the arrival of unexpected inflation. Entrepreneurs, by initially overestimating the real rates of interest that will prevail, will have been reluctant to borrow money. To that extent, entrepreneurs will choose too little short-term investment. Real vs. nominal confusions thus counteract the traditional Austrian claim, which suggests that entrepreneurs choose too much long-term investment.⁴⁷

It is hard to overestimate the confusion that caused by his use of “naïve expectations,” which Cowen (1997, 77) defines as: “entrepreneurs underestimate the probability that monetary inflation is responsible for observed changes in the economic data” that he assumes ABCT is based on. What is truly naïve is his assumption of rational expectations, which he (1997, 8) defines as: “Individual economic forecasts are efficient and unbiased; subjective probability distributions for an economic variable correspond to the true distribution. As a result, individual forecasting errors are serially uncorrelated over time.” And, implicit is his assumption that, insofar as expectations are concerned, only rational expectations are not naïve.

⁴⁷ Austrian economists have recognized the possibility of a Fisher effect from almost the beginning of their work in monetary (Mises, 1978, pp. 93-4), but have not considered whether imperfect Fisher effects might counteract traditional Austrian business cycle theory.

It is not, then, that “investors do not fully anticipate the forthcoming effects of money supply growth,” in the sense Cowen means; i.e., underestimating the effects re inflation. Instead, it is that they misestimate the effects first by underestimating them, and then by overestimating them, and not because they exhibit naiveté in the process of forming their expectations. Rather, these are the results of the human condition; i.e., of people operating in the flawed, real world, that necessitates having to make decisions when not even one market is perfectly competitive, much less all markets, and when not even one financial market is efficient, much less all such markets; and, of expectations formed by flawed human beings based in part upon their (bounded) rationality and in part upon their emotions. Alternatively put, Cowen’s “naïve expectations,” which he attributes to ABCT, has nothing to do with ABCT properly understood.

Cowen’s (1997, 90-91) claim that, “Incipient price inflation will not raise interest rates through a Fisher effect” is misleading. When the expansion of the supply of money/credit commences, investors, for the most part, do underestimate the price-inflationary effects re goods (especially as the initial form of price inflation – increases in the prices of financial assets – is taken as a positive sign) that will come at some point in the not too near future (as per Milton Friedman’s long and variable lags). It is *this* that causes expected real interest rates to decline with attendant affects on both the level and structure of demand.

However, after some time, the price-inflation, insofar as goods and resources are concerned, commences.⁴⁸ Unless the expansion of the supply of money/credit was huge, when these price effects start they will be relatively minor,⁴⁹ and entrepreneurs are likely to continue to underestimate them, thereby maintaining real interest rates at reduced levels. It is only as the monetary/credit expansion continues that these price effects become significant. At that point, the Fisher effect comes into play as lenders demand higher inflation premiums. And, having been burned once by earning real interest rates below what they had expected, thereby reducing their capital below what they had anticipated it to be, they tend to become more cautious and conservative, concerned more with preserving their capital, than earning high returns; i.e., they become more risk averse. This causes them to refuse to lend to less creditworthy would-be borrowers, and to tend

⁴⁸ The price inflation begins re financial assets at the same time as the monetary inflation commences.

⁴⁹ As praxeologists, of course, we could not make any such statement, for this science deals not in amounts, only directions. However, the present paper includes elements of theory and applications; i.e., it is not *pure* praxeology. We make this claim, then, not as an apodictic one, but rather as an empirical statement.

to overestimate future, price inflation, thereby demanding inflation premiums that not only cause expected real interest rates to increase more than would otherwise be the case, but to rise to levels in excess of those prevailing before the monetary/credit expansion.

So, yes, Cowen's analysis is correct when he claims that "Incipient price inflation will not raise nominal interest rates through a Fisher effect. Future price increases will arrive unexpectedly, and *ex post* real rates of interest will be lower than currently observed nominal rates would indicate. In other words, entrepreneurs will have overestimated forthcoming real rates of interest on borrowing. *Ex post* real borrowing rates will be especially low, perhaps even negative," but this is only true for the period from the commencement of the monetary inflation until the increases in the prices of real goods and assets becomes significant. It is not correct from that point on, although Cowen implies that it holds throughout, if not the entire cycle, at least throughout the boom phase.

Again, his statement that, "Entrepreneurs, by initially overestimating the real rates of interest that will prevail, will have been reluctant to borrow money. To that extent, entrepreneurs will choose too little short-term investment. Real vs. nominal confusions thus counteract the traditional Austrian claim, which suggests that entrepreneurs choose too much long-term investment," is misleading, if not incorrect.

Although much more could be said about these statements, we focus on the claim that, "Entrepreneurs, by initially overestimating the real rates of interest that will prevail, will have been reluctant to borrow money. To that extent, entrepreneurs will choose too little short-term investment. Real vs. nominal confusions thus counteract the traditional Austrian claim, which suggests that entrepreneurs choose too much long-term investment."

Cowen is correct that entrepreneurs initially overestimate the "real rates of interest that will prevail." The reason this is the case is that the same, beginning-of the period, underestimations of future, price inflation that cause decreases in the expected, real, rates of interest, also cause the real rates of interest realized at the end of the period to be less than those (same underestimates of) expected, real, rates of interest.⁵⁰ However, it is not

⁵⁰ The initiation of money/credit expansions causes both a decrease in nominal market interest rates and an underestimation of future price inflation. This combination results in reductions in the expected, real market rates of interest. However, the, decreased, expected, real market rates of interest, *ex ante*, prove, *ex post* to be higher than the realized, real, rates of interest; i.e. the expected, real rates, of interest decline,

correct that, because the realized, end-of-period, real rates of interest prove to be less even than the underestimates thereof, “entrepreneurs will choose too little short-term investment,” because they “will have been reluctant to borrow money.” That is, borrower-entrepreneurs’ overestimations of the real rate of interest cause them to borrow less than they would have had their estimates been correct; i.e., had their estimates been lower than they actually were. The problem is that although Cowen considers the actions of those entrepreneurs who are borrowers, he fails to take into account the actions of those entrepreneurs who are lenders. The period under consideration is the early stages of monetary inflations. There is no reason to think that lender-entrepreneurs’ expectations of price inflation differ systematically from those borrower-entrepreneurs during those time-periods. Therefore, lender-entrepreneurs’ overestimations of the real rate of interest cause them to lend *more* than they would have had their estimates been correct; i.e., had their estimates been lower than they actually were. Thus, there is no reason to think that, had expectations as to the real rate of interest been correct all around, investment would have been any different than it would have been with the widespread incorrect expectations. Although entrepreneur-borrowers would have desired to borrow more, entrepreneur-lenders would not have been willing to accommodate them. And, in that case, entrepreneurs would not, then, “choose too little short-term investment.” Thus Cowen’s claim that, “Real vs. nominal confusions thus counteract the traditional Austrian claim, which suggests that entrepreneurs choose too much long-term investment,” is incorrect.

8 Interest rate information

In this section Cowen (1997, 91) makes two kinds of charges. First, that Austrians are wrong in that they out rationally expect “even some rational expectations theorists.” He makes this criticism because of his position that “the Austrian claim therefore requires the relative insignificance of the real vs. nominal signal extraction problems” and “when it

but, viewed ex post, they prove to have been incorrect in that they did not decline as much as they should have.

An interesting point is that, although these insufficient declines are the result of the (ex ante) underestimations of the price inflation for the period under consideration, the problem could not be solved by correct, necessarily ex ante, estimations, in the sense that, had the estimations of expected, price inflation been correct to begin with, the problem would not even have arisen.

comes to real vs. nominal variables, the Austrian claim implicitly attributes information-processing skills to agents that even some rational expectations theorists, such as Lucas, do not.” As we explained the relative unimportance of this particular “signal extraction problem” for ABCT,⁵¹ we must reject this claim of Cowen.

Second, Cowen maintains in effect that even if ABCT is true, which of course in his view it is not, there are mitigating factors that weaken its effect. To wit, there is a “counteraction” or “offsetting” phenomenon, whereby some aspects of ABCT cancel out others. States this author (1997, 90-91):

Real vs. nominal mistakes counteract the tendency for chosen investments to be excessively long term, and raise the likelihood of investments which are insufficiently long term. . . . As long as the inflation continues, the real vs. nominal confusion counteracts the permanent vs. temporary confusion. If unperceived inflation continues, so will the unexpectedly low realizations of real interest rates. . . . If entrepreneurs come to anticipate the inflation, or if the inflation stops, the real vs. nominal confusion ceases. In those cases, however, the other signal extraction problems disappear as well, limiting malinvestment. . . . one signal extraction problem offers a kind of insurance against another signal extraction problem. Entrepreneurs underestimate the rate of money growth and conclude that a lower real interest rate is permanent when in fact it is temporary. . . . An error of this nature, however, will be partially remedied by the decline in borrowing costs brought on by unexpected inflation. The two postulated errors tend to offset each other.

There are problems here. This criticism incorrectly multiplies factors. It says, in effect, that X “counteracts” or “offsets” Y when X and Y are merely but different aspects of the same thing. For example, consider “Real vs. nominal mistakes counteract the tendency for chosen investments to be excessively long term, and raise the likelihood of investments which are insufficiently long term.” Focus on a confusion between real and nominal interest rates, of the sort where the entrepreneur is either fooled into over (e.g., mal) investing in the higher orders of the structure of production and/or subsidized into doing so. This does not at all “counteract the tendency for chosen investments to be excessively long term,” it *is* the tendency for chosen investments to be excessively long term.

⁵¹ That is, some entrepreneurs would find it profitable to reallocate resources in response to a monetary shock even though from the perspective of the all-knowing economist such reallocations will prove to be misallocations from the point of view of society-as-a-whole.

How, then, can one and the same thing counteract itself? Eating sweets and fatty foods leads to weight gain. The one inevitably follows the other. They are biologically connected with one another; that is, it is a law of nutrition that this be the case. The one can hardly “counteract” or “offset” the other. Similarly, real vs. nominal interest mistakes, in ABCT, lead to excessively long term malinvestments. The one inevitably follows the other. They are economically connected; e.g., according to the tenets of ABCT. Again, one can hardly “counteract” or “offset” the other.

The problem arises in large part from Cowen’s use of the concept of “long-term investments” instead of the correct concept – interest-rate-sensitive goods. This makes it virtually impossible to analyze his claim (Cowen, 1997, 90-91, footnote omitted) that, “Real vs. nominal confusions thus counteract the traditional Austrian claim, which suggests that entrepreneurs choose too much long-term investment.” His uses of the phrase “real vs. nominal confusions” are, themselves, confusing. Certainly he does not mean that entrepreneurs do not understand the difference between real interest rates and nominal interest rates (interest rates being the relevant variables in this part of his work). In fact, the only reasonable meaning that may be assigned to our author’s phrases is that entrepreneurs’ *ex ante* estimates of expected, price inflation prove to be erroneous, *ex post*. However, such errors or mistakes do not “counteract the traditional Austrian claim.” Rather, they are an important, though not the sole, *cause*, of the Austrian claim.

This is not, as he states, that entrepreneurs choose too much long-term investment, but rather that there is malproduction, especially in the form of excess production of *interest-rate-sensitive* goods. Because as explained, *supra*, even if we assume *arguendo*, per impossible, that an expansion of money/credit would lower actual nominal interest rates in the face of correct expectations as to the course of price inflation, the lowered actual nominal interest rates would be sufficient to cause a misallocation of resources in the direction of interest-rate-sensitive goods. Therefore, that (because of misestimations of expected, price inflation) expected real interest rates also decline reinforces, not counteracts, the effect of the decline in the actual nominal interest rates.

9 Investor interpretation of interest rates

In this section, Cowen maintains that there are “offsetting” or “counteracting” effects which render ABCT impotent. Only now, the factors at issue are the long- and short-term real rates of interest, not the phenomena mentioned above. He (1997, 92) states: “Monetary inflation tends to lower short-term real rates more than it lowers long-term real rates; the resulting signals limit entrepreneurial tendencies to malinvest.”

The problem, here, is the ambiguity involved with the phrase “limit entrepreneurial tendencies to malinvest.” If what Cowen means is that demands for interest-rate-sensitive goods do not increase as much as they would if expected long-term real interest rates declined as much as do expected short-term real interest rates, then he is correct, but his phrasing is misleading. If he means that because the short-term real rates decline more than do the long-term rates, “shorter-term projects” become more attractive than “longer-term projects,” then, in general, he is incorrect. What he neglects to consider is that, *ceteris paribus*, the longer the expected stream of net cash flows, the greater will be the increase in the present value for a given decrease in the discount rate. This “economic life effect” is very powerful. Therefore, even though when a money/credit expansion begins, and both the actual nominal, and expected real, short-term interest rates decline more than do their long-term counterparts, the present values of the expected longer streams will increase more than those of the expected shorter streams,⁵² whether the real or nominal interest rates are used to do the discounting.

Our author (1997, 93) also takes another crack at ABCT in this section by reiterating his objection to it on the ground that “Banks generally will not be fooled about current monetary policy – banks themselves receive the new inflationary monetary reserves. Under the Austrian claim, *someone* – at the very least the new money recipients – must know inflation has taken place rather than an increase in private savings.” This is unexceptionable if he means that banks (and, for that matter, anyone else who is paying attention) are aware of the Fed’s stated monetary policy.⁵³

⁵² Of course, one can make up examples where Cowen would be correct. For the combinations of relatively large differences in the declines between the short- and long-term rates, and relatively small differences between what are considered to be short- and long-term projects that are required to achieve Cowen’s result are most unrealistic.

⁵³ In the current era of the Fed, the stated policy takes the form of a target for the Federal funds rate.

But, the “must” is entirely unsustainable. First, as Cowen (1997, 94) himself acknowledges, it is the rare “investor who understands the Austrian theory.” When professional economists either ignore ABCT entirely, or reject it with derision,⁵⁴ it is difficult to see how knowledge of it can percolate into the investment community.⁵⁵ Moreover, because most bankers, as most economists, are not Austrians, even were they to realize when the receipt of reserves was an injection of new money, this would not affect their operations. This is so because to the extent that their investments are short term, they are able to raise the rates they charge when price-inflation materializes; and, as to longer-term investments, banks frequently package mortgages⁵⁶ into Mortgage-Backed Securities, including Collateralized Mortgage Obligations, which they then sell, earning the originations fees and, sometimes, fees for servicing them.

Second, it is exceedingly likely that even bankers, all-knowing creatures that they are, will be “fooled” about monetary polity. Cowen’s great trust in them is hard to reconcile with their failure to know if we are in a trough or a peak in the business cycle at any given time, let alone a quarter or more into the past. How often does the National Bureau of Economic Research revise its estimates as to the pattern of business? It is an everyday occurrence (<http://www.nber.org/>). If experts at that august institution are “fooled,” then it is more than likely this applies to everyone else as well. Moreover, open market operations are conducted only between the Fed and “primary dealers,”⁵⁷ (and/or their customers).⁵⁸ Any funds transfers are made between the Fed and these dealers’ (or their customers’) clearing banks. Thus, banks in general have no knowledge of specific

⁵⁴ For example, Yeager (1986, 378) said: “I want to support modern Austrianism by helping rid it of an embarrassing excrescence.” ABCT was what he was referring to as an “embarrassing excrescence.”

⁵⁵ We speculate, however, that knowledge about, and appreciation for, ABCT is more prevalent among professional investors than in academia, since the latter do not directly and financially suffer from erroneous opinions as do the former.

⁵⁶ Actually these are notes, usually made in connection with residential properties, secured by mortgages.

⁵⁷ At present there are but 22 of them: ABN AMRO Bank, N.V., New York Branch; BNP Paribas Securities Corp.; Banc of America Securities LLC; Barclays Capital Inc.; Bear, Stearns & Co., Inc.; CIBC World Markets Corp.; Citigroup Global Markets Inc.; Countrywide Securities Corporation; Credit Suisse First Boston LLC; Daiwa Securities America Inc.; Deutsche Bank Securities Inc.; Dresdner Kleinwort Wasserstein Securities LLC.; Goldman, Sachs & Co.; Greenwich Capital Markets, Inc.; HSBC Securities (USA) Inc.; J. P. Morgan Securities Inc.; Lehman Brothers Inc.; Merrill Lynch Government Securities Inc.; Mizuho Securities USA Inc.; Morgan Stanley & Co. Incorporated; Nomura Securities International, Inc.; UBS Securities LLC. See on this http://www.ny.frb.org/markets/pridealers_current.html.

⁵⁸ Some are conducted with foreign official and international institutions.

open market operations, whether as to the value of transactions⁵⁹ or the nature thereof. This holds true for temporary ones, involving repurchase agreements or reverse “repos,” or permanent ones involving outright purchases or sales, or the specific portions of the term structure involved. Therefore, only ex post can banks be aware of the nature of the reserves they receive – preexisting reserves or reserves newly created. Ordinarily, unless a bank receives reserves directly from the Fed, either for the account of a primary dealer or a customer of a primary dealer, it has no idea whether the reserves are newly created or not.

Third, as we have argued above,⁶⁰ *even if, arguendo, no one* is “fooled,” still, the extra money flowing into the credit market will *subsidize* entrepreneurs into making unsustainable investments in the higher orders of production.

10 Validation of inflationary investments

Here, Cowen (1997, 94) argues that “Even if an initial burst of money growth increases the term-length of investment, it remains an open question whether these new investments are necessarily malinvestments.”⁶¹ But it is not really an “open question,” for he (1997, 94) also says: “Constant rates of nominal money growth, or nominal money rules, may sustain the new long-term projects to some degree.”

Our author (1997, 94) considers two cases; first, “an initial burst of unexpected inflation, followed by maintenance of that inflation rate for the foreseeable future.”

Let us quote Cowen at length on this, to ensure there are no misunderstandings that arise from such a source.⁶² He (1997, 95) says:

I see the “natural rate of interest” as an incomplete concept; the more important relation is whether investors’ expectations are consistent with forthcoming market demands and supplies. In Austrian models the interest rate *always* clears the market

⁵⁹ When it enters the open market, the trading desk of the NY Fed does not reveal the value of the intended transactions.

⁶⁰ See also Block (2001), Barnett and Block (unpublished).

⁶¹ As throughout, Cowen does not make clear exactly what type of investments these are.

⁶² Had Cowen quoted from, or more fully cited the Austrians he criticizes, his misinterpretations of them might well have been fewer.

for loanable funds. In that sense the market rate is always a “natural” rate or an “equilibrium” rate. If expectations are sufficiently sophisticated, this real interest rate will not induce disequilibrium, even if it has been lowered by monetary inflation. If entrepreneurs know that inflation caused the lower real rate, they do not necessarily respond with malinvestments. They can simply borrow the new funds and make safe, short-term investments. I am not suggesting that entrepreneurs always see through inflation, but the example shows that we cannot blame the level of the interest rate *per se*. Intertemporal discoordination arises, not when interest rates are at “incorrect” levels, but when entrepreneurs misinterpret the information contained in interest rates and other market signals. Inflation may increase the likelihood of incorrect forecasts, but business cycle theory should focus on the derived expectational errors, rather than assuming that any inflation-induced interest rate movement necessarily creates distortions of a particular kind.

There are problems here.

In his reliance on “sufficiently sophisticated expectations,” again Cowen relies upon a virtually all-knowing economic actor. In this, he takes the side of the socialists in the Austrian vs. Socialist Calculation Debate,⁶³ only he substitutes his new brand of omniscient entrepreneur for the central planner. The relevant Austrian insight in this calculation debate is that it is *only* (accurate) market signals that give us even a hope and a prayer of attaining rational economic calculation. The entrepreneur is not a magician.⁶⁴ Be his expectations ever so “sophisticated,” he simply cannot be relied upon to ferret out optimal savings, investment, time preference rates, structure of production, etc. With all the possible sources of error, the entrepreneur requires market price signals, and accurate ones at that, if his calculations are not to lead to substantial misallocations of resources and concomitant losses. Cowen writes as if a modern complex economy is somehow equivalent to that of a Robinson Crusoe – Friday scenario, or perhaps that of the Swiss Family Robinson, with fewer than a dozen economic actors all told. Then, and only then, can the economy limp along, or, perhaps, even thrive, as Cowen would have it, in the absence of market price and interest rate signals. “See through inflation,” indeed.

⁶³ For the opposite viewpoint see Boettke, 1991, 1993; Gordon, 1990; Hoppe, 1989, 1991, 1996; Keizer, 1987; Klein, 1996; Lavoie, 1981; Mises, 1975, 1981; Rothbard, 1976, 1991; Salerno, 1990, 1995

⁶⁴ Still less so, of course, is the central planner – at least the former but not the latter benefits from the weeding out process of capitalism. Entrepreneurs who misread prices, or act in defiance of them, are disproportionately likely to lose profits, and ultimately be drawn into bankruptcy. The ones who remain are less likely to exhibit this calculational error.

Cowen seems to have great faith in the power of rational expectations. It is as if by invoking the term “rational expectations,” or in this instance, “sufficiently sophisticated expectations,” monetary inflation, regardless of its effect on the real rate of interest, cannot cause a misallocation of resources. But he hoists himself on his own petard. For, if, as he assumes, “expectations are sufficiently sophisticated,” then of course, “this real interest rate will not induce disequilibrium, even if it has been lowered by monetary inflation.” But the reason is not, as he thinks, because: “If entrepreneurs know that [monetary] inflation caused the lower real rate, they do not necessarily respond with malinvestments.” No, the reason is that if they know the real interest rate was lowered by monetary inflation they know an impossibility. That is, with the ability to form such sophisticated expectations, as soon as the monetary inflation begins, they will discern the price inflation to follow,⁶⁵ and, in response, drive nominal rates up by the amount of the expected price inflation, thereby maintaining the real interest rates at their “natural” levels; i.e., at the levels that would have prevailed in the absence of the monetary inflation. Therefore, there would be no malinvestments because the monetary inflation would not have caused a decrease (or increase) in real interest rates.

Cowen (1997, 95) also maintains that: “Intertemporal discoordination arises, not when interest rates are at ‘incorrect’⁶⁶ levels, but when entrepreneurs misinterpret the information contained in interest rates and other market signals.” Of course, if an entrepreneur misinterprets correct market signals he will cause intertemporal discoordination. But entrepreneurs who do so are soon driven from the market and, therefore, such errors do not cause business cycles. Rather, it is when, and because, “interest rates are at ‘incorrect’ levels,” that sufficient entrepreneurial errors arise to cause massive intertemporal discoordination; i.e., business cycles.

Now to his second point. How does the analysis change for Cowen under the assumption of constant monetary growth? He starts off this section of his work on a high note, exhibiting, but for one single word, a correct understanding of ABCT. He says (1997, 96-97, emphasis added by present authors):

Proponents of the Austrian claim offer a primary argument why constant rates

⁶⁵ Of course, with such sophisticated expectations, the inflation would follow instantaneously.

⁶⁶ We find the quote marks around this word highly problematical. It implies that there is no such thing as a correct level, even in principle.

of money growth may not sustain new investments. Once the new inflationary funds spread through the economy, old spending/saving patterns will reassert themselves. Banks channeled the entirety of the inflationary burst into the loanable funds market, but the recipients of the invested funds *probably* will not save the entirety of their new income. These fund recipients will demand goods and services in accordance with their previously expressed market-place demands. The Austrians argue consumers will demand goods and services consistent with the pre inflation structure of production, rather than with the post-inflation structure.

The problematic one word is of course “probably.” If this were eliminated from the above quote, Cowen might have been saved his subsequent misinterpretations of ABCT. For the latter is predicated upon different round recipients of the new inflationary money revealing different time preferences, or, in Cowen’s (1997, 97) Keynesian expression of this phenomenon, “marginal propensities to consume.”⁶⁷

But ABCT makes the *ceteris paribus* assumption, and takes it seriously. *Of course* if the market participants magically change their time orientation in precisely the manner that will justify the new structure of production based upon the inflation, then there will be no ABC. But *why* should we expect the people to change their savings – consumption choices in the right direction (e.g., more of the former, less of the latter), neither over or under shooting that precise additional amount necessary if the decisions of the entrepreneurs, based upon the inflation, are to be proved correct? Cowen is speaking of a dream world, fashioned, expressly, to undermine ABCT. Well, we “concede.” If such a world were actually to exist, ABCT would not be able to explain it.

If, somehow, magically, people can be induced to change their time preferences, after the fact so to speak, so as to ensure that what previously appeared to be a malinvestment was no longer that, then ABCT would not be wrong, but the ABC would be nullified. And thus ABCT would not *apply* to such a situation. In other words, assume the following. We are now at equilibrium with an interest rate of 5%. The government pumps money into the credit market, lowering the interest rate to 2%. Entrepreneurs lengthen the structure of production by reallocating resources to higher (earlier) orders of goods. It looks as if the ABC is in the process of getting started, because it appears as if this reallocation of resources will prove to be a malinvestment. That is, we expect it soon to

⁶⁷ For a critique of this concept, see Hazlitt (1959, 49, 98-134, 429)

be discovered that the people are back at the same old lemonade stand, saving and investing and consuming as if their time preferences, which give rise to the old interest rate of 5%, have not changed. Whereupon a miracle occurs. Cowen waves his magic wand, and, *mirabile dictu*, time preferences fall, and with them the interest rate, to, you'll never guess what, yes, precisely 2%. Thus, the reallocation of resources prove in fact not to be misallocations/malinvestments, but rather to be warranted by these new lower time preferences.

But there is simply no reason to suppose this to be a realistic model of the actual world. Nor can we acquiesce in Cowen's notion that the banks, as the "first-round fund recipients" of the new inflationary money will act, *qua consumers* any differently than anyone else, to wit, second, third, etc., round recipients of the new monies.⁶⁸ Bankers, to be sure, can be relied upon to act differently than non-bankers in their professional capacities. There is, after all, such a thing as specialization and the division of labor. But we need not assume that this is necessarily so for bankers in their capacity as consumers. Indeed, *ceteris paribus* methodology *requires* us to posit that this is *not* the case.

Cowen would have a more accurate picture of ABCT in his mind if he assumed, *arguendo*, that each and every economic actor had precisely the *same* time preference orientation, and that it did not change by one iota in response to his constant money growth scenario.

States this author (1997, 97) however: "Entrepreneurs can avoid being fooled if they recognize that expenditure patterns do not remain constant across differing rounds of received funds." But no advocate of ABCT ever made any such claim. Rather, the usual assumption in this school of thought is that the very likely different spending patterns of the people in the different rounds would not be *systematic*. Cowen, here, is creating a straw man and then attempting to knock it down. His attempt fails. *Even if* entrepreneurs "realize that latter-round recipients of the newly spent funds need not allocate those funds in the same manner as the first-round recipients" (1997, 97) this would *still not* undermine the Austrians' finding that artificially lowering interest rates through inflation will entice entrepreneurs to malinvest, and that these placements would be unsustainable once the *unchanged* time preference rates of the populace again registered.

⁶⁸ The banks, *qua* first round recipients, are producers, not consumers.

Cowen (1997, 97-98, footnotes added) maintains that:

The Austrian claim implies that for one kind of forecast – inferring the spending and saving preferences of latter-round fund recipients – fixed positive rates of money growth may increase the volatility of the environment. Several hypotheses attempt to explain why this signal extraction problem might become worse; each hypothesis is plausible, but none is necessarily compelling. In each case the validity of the Austrian claim relies on the postulation of yet another set of signal extraction problems.

One hypothesis notes that inflation disrupts the link between the rate of interest on loanable funds and consumers' intertemporal marginal rate of substitution. Investors no longer have access to a price signal which directly expresses the intertemporal marginal rate of substitution on non-inflationary funds. Positive rates of money growth create a wedge between the savings rates of first-round recipient of funds and latter-round funds recipients. Price signals reflect marginal rates of saving – those of bank shareholders – which are not representative of the economy as a whole.^{69,70}

At this point we must distinguish between preferences in the praxeological sense and preferences in the thymological sense. Properly understood, an individual, on the basis of his “thymological preferences,” chooses from among only those alternatives of which he is aware. A monetary inflation that changes the set of alternatives perceived by an individual may cause him to change his behavior. In that case, monetary inflation is the cause of a change in his “praxeological preferences,” as revealed by his actions; i.e., his preferences in the praxeological sense. But there is absolutely no reason to think that this would change his “thymological preferences.” Therefore, it is necessarily true that the marginal rates of savings, as manifested by praxeological preferences, of first-round recipients are different from those of latter-round recipients; i.e., “not representative of

⁶⁹ Surely, Cowen is referring to the preferences of banks' depositors and borrowers, as well as their shareholders; i.e., owners. It is the joint interactions of these people that affect the quantity and quality of bank credit and interest rates.

⁷⁰ The relevant preferences are praxeological, not thymological, and, as praxeological preferences are only manifested in action, such preferences are necessarily marginal.

the economy as a whole.”⁷¹ And, it is precisely those praxeological preferences that are relevant in this context.⁷² Of course, individuals’ praxeological preferences are not the same either because their thymological preferences are different, or because they have different perceptions of the sets of available alternatives. Regarding this point of Cowen, it matters not one whit whether one or both of factors is responsible for the divergences in praxeological preferences.

This argument suffices to defeat Cowen’s point, in that we have shown that the first of his three plausible, but not compelling, hypotheses, is in fact compelling. Therefore, based on Occam’s Razor, we do not address the other two hypotheses.

Cowen (1997, 99) concedes that “Entrepreneurs will sometimes forecast the real effect of inflation incorrectly, and will sometimes choose unsustainable long-term investments.” What he fails to acknowledge is that this is the “cluster of errors” of ABCT (Rothbard, 1963). It is not, merely, that “sometimes” entrepreneurs misallocate investment resources. Very much to the contrary, they do this *all the time*. That is, entrepreneurial error is a constant and continual occurrence; it takes place *every day*. And, these errors are in *all* directions: sometimes in the direction of excessively “long-term investments,” sometimes in the direction of excessively “short-term investments.” Even when they get this aspect correct, there are still numerous other errors possible: purchasing factors that are not complementary to what already exists, misunderstanding changing consumer tastes, etc.

If that were all there was to the matter, the weeding out process of profit and loss would soon enough put paid to their mistakes. That is, there is a word for entrepreneurs who err excessively: “bankrupt.” Thus, at any given time, absent government subsidies to the contrary, we can posit that the entrepreneurs now active are the best the population can support. True, they still commit errors, but minimally, at least compared to other institutional arrangements.

⁷¹ One might note that: 1) it is probably only people who have bought into modern, mainstream macroeconomics with its use of representative agents and utility functions (a totally non-praxeological concept) who would even think it worth mentioning that different people have different preferences; and, 2) that only one so schooled, who having mentioned it, would suggest that, though “plausible,” it is not “necessarily compelling.”

⁷² Of course, when Austrian economists speak of the misallocation of resources that occurs during the business cycle, that misallocation is re thymological preferences, as there can never be a misallocation re praxeological preferences.

The real problem is not that there are errors, but that sometimes they are *systematic*; that there is a *cluster* of them, and preponderantly in one direction. That this should be the case calls for *explanation* and only ABCT has been so far able to account for this phenomenon.

When one student misses a question on an exam, it is his fault. When the entire class does so, poor students but good ones too, then we cannot rule out the hypothesis that it is the fault of the professor. A similar consideration applies here. When one or a few entrepreneurs misallocate resources in the direction of more interest-rate-sensitive goods, it is their fault and they pay a penalty. When most or all investors do so, it is by no means clear they are to blame. Here, the economy in general suffers. In such a case, we look seriously at the possibility that they were systematically misled. And who or what is the possible culprit? Why, it is false signals in the form of non market prices and rates of interest, according to ABCT. And these in turn come to us courtesy of the monetary/credit inflation engendered by government in conjunction with the banking system.

Consider now Cowen's (1997, 100) charge: "Under the Austrian claim, only those entrepreneurs who make new investments during an inflationary boom will misallocate resources; previously invested resources should not become unprofitable."

But this is clearly wrong. Let us argue here by analogy. Assume a market in equilibrium,⁷³ whereupon government somehow contrives matters so that there soon are greater investments in pencils than there otherwise would have been but for this intervention. The producers of these new superfluous (from the point of view of unchanging consumer tastes) writing implements will lose money. But what of the previous firms in the industry, the marginal one earning normal profits and the infra marginal ones earning economic profits at the outset of our little mental experiment? According to the "logic" employed by Cowen, they would be safe. After all, these "previously invested resources" should not become unprofitable; "only investments made within a particular time frame should become unprofitable" (Cowen, 1997, 100), and the "particular time" is *after* the governmental intervention into the pencil market.

⁷³ We appreciate Garrison's (2001) emphasis on the point that economics must explain not only the boom bust cycle, but also the possibility that the economy ever avoids these two alternatives.

But a moment's reflection will convince us that "pencils are pencils are pencils."⁷⁴ The market little knows, and distinguishes, if anything, less, between properly (before government promotion of excessive pencils) and improperly (after) invested pencil resources. It is an equal opportunity destroyer of profits in this industry, given that there are too many pencils available. That is, given the increase in the supply, the prices of pencils will decline. Consider the firms, new or old, that made the new investments in pencil production. Some of their sales can be explained by an increase in the quantity demanded of pencils resulting from the decreased prices, but some could be expected to come at the expense of firms that did not make new investments. Additionally, competition for resources in the pencil industry will rise. The combination of these factors will put a squeeze on profits in the industry, and not only for those firms that did not engage in new investment.

Moreover, if, as is to be expected, prices of pencils decline, firms in other industries will find that their sales are affected. And, those that have to compete for resources with the pencil industry find the prices that they have to pay higher for those resources.

Now return to macro theory. The same considerations apply. *Not* "only those entrepreneurs who make new investments during an inflationary boom" will suffer losses. *All* of those who misallocate resources will suffer. This includes both those who before, by stipulation, were investing correctly, and those, who, again by stipulation, were not (they were either fooled or subsidized into making these investments). To further mix our metaphors, a rising tide raises all boats.

Therefore, it is clearly incorrect to argue that "previously invested resources should not become unprofitable."⁷⁵

⁷⁴ We are speaking her thymologically, not praxeologically.

⁷⁵ Given that Cowen's point, were it correct, would apply to excess investment regardless of the cause, examples that prove it to be incorrect occur with great regularity. Consider the investments in retailing that become unprofitable because of new Wal-Mart stores. However, if one desires examples arising specifically because of a monetary induced decrease in interest rates, there are the declines in profitability of older office and apartment buildings when new structures of those types arise precisely because of such lowered interest rates.

11 Conclusion

We have thoroughly discussed Cowen's (1997) numerous critiques of ABCT. We have not seen our way clear to agreeing that any of them call for revision of this theory. However, we are indeed and nevertheless very grateful to this author on several grounds. First, his commentary shows great familiarity with the Austrian analytical apparatus; there was thus very little of "ships passing in the night" in our disagreements with him. To the contrary, we have achieved real disagreement, something not to be spurned in intellectual debate. Second, the thoroughness and yes, severity of his criticism, have forced us to a deeper appreciation of ABCT than otherwise we would have had.

Bibliography

- [1] Barnett, William II, and Walter Block. Forthcoming A. "Reply to Hummel on Austrian Business Cycle Theory." *Reason Papers*.
- [2] Barnett, William and Walter Block. Forthcoming B. "On Hayekian Triangles." *Procesos De Mercado: Revista Europea De Economia Politica*.
- [3] Barnett, William and Walter Block. 2004. "On the Optimum Quantity of Money," *Quarterly Journal of Austrian Economics*, Vol. 7, No. 1, pp. 39-52;
http://www.mises.org/journals/qjae/pdf/qjae7_1_4.pdf
- [4] Barnett, William II, and Walter Block. 2005. "Professor Tullock on Austrian Business Cycle Theory." *Advances in Austrian Economics*. Vol. 8, pp. 431-443.
- [5] Barnett, William II, and Walter Block. Unpublished. "Saving and Investment, Loanable Funds, and Financial Assets: A Praxeological Approach"
- [6] Barnett, William II, and J. Stuart Wood. 2002. "Business Cycle Theory and Stagflation." Proceedings of the 8th Annual Austrian Scholars Conference.
<http://www.mises.org/asc/2002/asc8-barnett.pdf>
- [7] Bernanke, Ben. S. 11/21/2002. "Deflation: Making Sure 'It' Doesn't Happen Here." Remarks before the National Economists Club, Washington, D.C.
<http://www.Federalreserve.gov/boarddocs/speeches/2002/20021121/default.htm>

- [8] Block, Walter. 2001. "Yes, We Have No Chaff: A Reply to Wagner's 'Austrian Business Cycle Theory: Saving the Wheat While Discarding the Chaff.'" *Quarterly Journal of Austrian Economics*. 4 (1): 63-73.
http://www.mises.org/journals/qjae/pdf/qjae4_1_4.pdf
- [9] Block, Walter. 2002. "Henry Simons Is Not A Supporter of Free Enterprise," *Journal of Libertarian Studies*. 16 (4): 3-36;
http://www.mises.org/journals/jls/16_4/16_4_2.pdf.
- [10] Boettke, Peter J. 1991. "The Austrian Critique and the Demise of Socialism: The Soviet Case," in *Austrian Economics: Perspectives on the Past and Prospects for the Future*. Vol. 17, Richard M. Ebeling, ed., Hillsdale, MI: Hillsdale College Press, pp. 181-232.
- [11] Boettke, Peter J. 1993. *Why Perestroika Failed: The Politics and Economics of Socialist Transformation*, London: Routledge
- [12] Cowen, Tyler. 1997. *Risk and Business Cycles: New and Old Austrian Perspectives*. London: Routledge.
- [13] Friedman, Milton. 1953. "The Methodology of Positive Economics." *Essays in positive economics*, Chicago: University of Chicago Press, pp. 3-43
- [14] Friedman, Milton. 1968. "The Role of Monetary Policy." *American Economic Review*. 58 (1): 1-17
- [15] Friedman, Milton. 1992. *Money Mischief*. Harcourt Brace Jovanovich, Pub.
- [16] Garrison, Roger. 1982. "Austrian Economics as the Middle Ground: Comment on Loasby," in: *Market Process, and Austrian Economics: Essays in Honor of Ludwig von Mises*, Kirzner, Israel M., ed., Lexington MA: Lexington Books, pp. 131-138
- [17] Garrison, Roger W. 2001. *Time and Money: The Macroeconomics of Capital Structure*. London: Routledge
- [18] Gordon, David. 1990. *Resurrecting Marx: The Analytical Marxists on Freedom, Exploitation, and Justice*, New Brunswick, NJ: Transaction.
- [19] Hall, Thomas E., and David Ferguson. 1998. *The Great Depression: An International Disaster of Perverse Economic Policies*. The University of Michigan Press.

- [20] Hayek, Friedrich A. 1935. *Prices and Production*. 2nd ed. London: Routledge.
- [21] Higgs, Robert. 1997. "Regime Uncertainty: Why the Great Depression Lasted So Long and Why Prosperity Resumed after the War." *The Independent Review*. 1(4): 561-590.
- [22] Hazlitt, Henry. 1959. *The Failure of the "New Economics."* New York: Van Nostrand
- [23] Hoppe, Hans-Hermann. 1989. *A Theory of Socialism and Capitalism*, Boston, MA: Kluwer Academic Publishers.
- [24] Hoppe, Hans-Hermann. 1991. "De-Socialization in a United Germany," *Review of Austrian Economics*, 5(2): 77-106.
- [25] Hoppe, Hans-Hermann. 1996. "Socialism: A Property or Knowledge Problem?" *Review of Austrian Economics*, 9(1): 147-154.
- [26] Hummel, Jeffrey R. 1979. "Problems with Austrian Business Cycle Theory," *Reason Papers*, No. 5, Winter, 41-53.
http://www.reasonpapers.com/pdf/05/rp_5_4.pdf
- [27] Keizer, William. 1987. "Two Forgotten Articles by Ludwig von Mises on the Rationality of Socialist Economic Calculation," *Review of Austrian Economics*, 1, pp. 109-122;
- [28] Keynes, John Maynard. 1936. *General Theory of Money, Interest and Employment*, New York: Harcourt, Brace
- [29] Kirzner, Israel M. 1973. *Competition and Entrepreneurship*. Chicago: University of Chicago Press.
- [30] Klein, Peter G. 1996. "Economic Calculation and the Limits of Organization," *Review of Austrian Economics*, 9(2), pp 3- 28;
- [31] Lavoie, Don. 1981. "A Critique of the Standard Account of the Socialist Calculation Debate," *The Journal of Libertarian Studies*, Vol. V, No. 1, Winter, pp. 41-88.
- [32] Mises, Ludwig von. 1971 [1912]. *The Theory of Money and Credit*. Foundation for Economic Education.

- [33] Mises, Ludwig von. 1975[1933]. "Economic Calculation in the Socialist Commonwealth," in Hayek, F.A., ed., *Collectivist Economic Planning*, Clifton, N.J.: Kelley
- [34] Mises, Ludwig von. 1981 [1969]. *Socialism*, Indianapolis:LibertyPress/LibertyClassics.
- [35] Mises, Ludwig von. 1957. *Theory and History*, New Haven: Yale University Press.
<http://www.mises.org/th.asp>
- [36] Mises, Ludwig von. 1978. *On The Manipulation of Money and Credit*. Free market Books.
<http://www.mises.org/manipulation/section2.asp>
- [37] Mises, Ludwig von. 1998. *Human Action: The Scholar's Edition*, Auburn, AL.: The Mises Institute.
<http://www.mises.org/humanaction.asp>
- [38] Rothbard, M. 1963 [1975]. *America's Great Depression*. Kansas City: Sheed Andrews.
<http://www.mises.org/rothbard/agd.pdf>
- [39] Rothbard, Murray N. 1976. "Ludwig von Mises and Economic Calculation Under Socialism," Moss, Laurence S., ed., *The Economics of Ludwig von Mises*, Kansas City: Sheed & Ward, pp. 67-77
- [40] Rothbard, Murray N. 1991. "The End of Socialism and the Calculation Debate Revisited," *Review of Austrian Economics*, 5(2), pp. 51-70.
- [41] Salerno, Joseph T. 1990. "Postscript: Why a Socialist Economy is 'Impossible'," in *Ludwig von Mises, Economic Calculation in the Socialist Commonwealth*, Auburn, AL: Ludwig von Mises Institute, pp. 51-71.
- [42] Salerno, Joseph. 1995. "A Final Word: Calculation, Knowledge and Appraisalment," *Review of Austrian Economics*, Vol. 9, No. 1, pp. 141-142;
http://www.mises.org/journals/rae/pdf/rae9_1_8.pdf
- [43] Salerno, Joseph T. 1989. "Comment on Tullock's 'Why Austrians Are Wrong About Depressions'," *Review of Austrian Economics*, Vol. 3, pp. 141-145;
http://www.mises.org/journals/rae/pdf/rae3_1_11.pdf
- [44] Simons, Henry. 1936. "Rules vs. Authority in Monetary Policy," *Journal of Political Economy*, Vol. XLIV

- [45] Snowdon, Brian, Howard Vane and Peter Wynarczyk, eds. 1994. *A Modern Guide to Macroeconomics: An Introduction to Competing Schools of Thought*. Cheltenham, UK: Edward Elgar.
- [46] Tullock, Gordon. 1987. "Why the Austrians Are Wrong About Depressions." *Review of Austrian Economics* 2: 73-78.
http://www.mises.org/journals/rae/pdf/rae2_1_4.pdf
- [47] Tullock, Gordon. 1989. "Reply to Comment by Joseph T. Salerno." *Review of Austrian Economics* 3: 147-49.
http://www.mises.org/journals/rae/pdf/rae3_1_12.pdf
- [48] Wagner, Richard E. 2000. "Austrian Cycle Theory: Saving the Wheat while Discarding the Chaff," Festschrift for James Buchanan.
<http://www.gmu.edu/jbc/fest/files/wagner.htm>
- [49] Yeager, Leland B. 1986. "The Significance of Monetary Disequilibrium." *Cato Journal*. 6 (2): 369-99.