

Crash and Carry: Financial Intermediaries, the Intertemporal-Carry Trade, and Austrian Business Cycles¹

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ABSTRACT

Barnett and Block (2008) establish that not only are fractional reserve demand deposits fraudulent and create an Austrian Business Cycle (ABC), but that a certain type of mismatching between *time* deposits and the period for which the depository institution re-lends the deposited funds (banks or other financial intermediaries “borrowing short and lending long”) are also contrary to libertarian law. The question we address in the present paper is whether or not this type of disconnect between the period for which the ultimate lender committed funds and the ultimate borrower gained possession thereof also necessarily start an Austrian Business Cycle. Even though this does *not* constitute an increase in the stock of money, we answer in the affirmative.

1. Introduction

The essence of Austrian Business Cycle Theory (ABCT) is as follows. A reduction in interest rates below what they would be in truly free markets, as a result of monetary inflation causes² an unsustainable boom. The boom consists in a misallocation of resources such that production is not as fully aligned with consumers’ inter temporal preferences as they otherwise would be. The boom either ends in crisis that takes either the form of a hyperinflation that destroys the monetary system or that of credit contraction. The crisis is followed by a bust during which resources are reallocated to their appropriate uses. The critical part of ABCT is the unsustainable, inter temporal, misallocation of resources set off by the initial interference with interest rates.

¹ The authors wish to thank Laura Davidson for editorial assistance.

² Monetary inflation herein refers to any increase in bank notes (or other currency) or demand deposits that are not fully backed by the relevant monetary commodity. Of course, in a pure fiat money economy any increase of such artifacts constitutes monetary inflation.

This paper considers three different, but interrelated, aspects of ABCT – fiat money, fractional-reserve banking and intermediation, and “real liquidity” – in order to come to a more complete understanding of the reality that is the concern of the theory: As can be seen in table 1, fractional-reserve banking,³ to include both demand deposits and/or banknotes, is a sine qua non of traditional ABCT, whereas fiat money is not.

Table 1

	Fractional-reserve bank (demand) deposits &/or banknotes	100%-reserve banking
Fiat money	ABC ⁴ + price inflation	Price inflation without ABC
Commodity money	ABC ⁵ + price inflation	Neither price inflation nor ABC

Section 2 is devoted to an explication of financial intermediation, and its relation to the ABCT. The purpose of section 3 is to bring dealing into this analysis. Section 4’s burden is to consider credit risk versus (financial) liquidity risk. In section 5 we contrast financial and real liquidity and in section 6 relate financial intermediation and ABC. Section 7 asks “Can fraudulent time deposits lead to an Austrian Business Cycle?” we answer in the affirmative. We conclude in section 8.

³ Fractional-reserve banking is herein taken to refer to the time-carry trade, more broadly; i.e., it is a specific form of the carry trade.

⁴ In such conditions, a boom may be both of very lengthy duration and great magnitude, before it is brought to a halt by its attendant crisis.

⁵ In cases such as this, the period before the onset of the crisis is almost certain to be shorter, and the magnitude smaller, than in that of the case of footnote 3, supra. This is because a commodity money, even under fractional reserve banking (frb), serves as a leash, or a check, upon the ability of the banks, central or otherwise, to expand money.

2. Financial Intermediation

This brings us to the matter of finance. Let us divide people/households/businesses into two groups: surplus units, hereinafter A, and deficit units, hereinafter C.⁶ An A is one that controls more resources than it cares to at a particular point in time, whereas a C controls fewer. Assuming that the excess resources⁷ take the form of currency, but disregarding its form,⁸ let us examine the (generic) ways in which the transfer may take place.

A may either buy an equity stake⁹ in C, or may become creditors by lending the excess resources directly to D. In either case in so doing a broker may be used, but he, qua broker, “merely” brings the buyer and seller or borrower and lender together for a fee.¹⁰ However, brokerage is not the only form of intermediation. For our purposes, the intermediation process may be thought of as a dichotomy: brokerage and dealing.¹¹ Dealing involves intermediaries inserting themselves between A and C such that they acquire title to A’s excess currency and then divest the excess currency so acquired to C under a new title. Often, multiple dealers intermediate between the A that provide(s), and the C that ultimately acquire(s) the excess currency. Only dealing is relevant for business cycles; brokerage is not. Moreover, only dealing involving credit is relevant.¹² Consequently, hereinafter we consider only dealing in credit.

⁶ A and C refer, as appropriate, either to individual units or to multiple units.

⁷ I assume that the excess resources are valuable, and therefore the disposition is not by abandonment.

⁸ What “forms” can currency take? We refer, here, to cash, whether governmental or private; e.g., U.S. Notes, U.S. Treasury Gold Certificates, National Bank Notes, U.S. Treasury Silver Certificates, Federal Reserve Notes, or U.S. coins.

⁹ This option is not always available.

¹⁰ Although A and C may find each other without outside assistance, in a modern society in which, literally, billions of people are interconnected economically and financially, this is not the normal course of events. Rather, intermediaries facilitate the process. Specialization of labor is an important factor in this regard because specialization of knowledge and consequent economies scale reduce search costs.

¹¹ It is not uncommon for intermediaries to engage in both of these functions.

¹² Mutual and exchange-traded funds that invest in equities may be thought of as equity dealers.

3. *Dealing*

Dealers perform several functions.

1) They facilitate economies of scale. Rarely does the amount of excess resources that an individual A wishes to lend coincide exactly with the amount that an individual C wishes to borrow. In cases where a C requires more funds than an individual A is willing to provide, the dealer aggregates funds from multiple A; in cases where an individual A is willing to provide more than any individual C requires, the dealer divides the funds among multiple C.

2) Dealers also use their specialized knowledge to evaluate the credit risk of different C to determine which are credit worthy and at what interest rate spread. Moreover, they monitor credit risk during the life of the loan to C using covenants to reduce credit risk; i.e., defaults.

3) Because the titles dealers give to A are not directly linked to any specific C, A gain diversification of default risk.

4) Dealers, by engaging in the inter temporal-carry trade; i.e., borrowing short and lending long, facilitate a structure of credit/liquidity in which C are able to borrow for longer periods and at lower rates of interest than would otherwise be possible. In fact, this is the source of liquidity risk, in contradistinction to credit risk, in a society. It is this function of dealers that is relevant for business cycles, and the one this paper considers.

This paper, then, is concerned with the relation between financial intermediation in which the intermediary borrows short to lend long and business cycles.

4. *Credit risk versus (financial) liquidity risk*

Consider the following. A lends money to B (think “bank”), who in turn lends it to C. If B defaults on its obligations to A because C defaulted on its obligations to B, the problem is one of credit. This type of problem can arise in any type of credit transaction. However, if B defaults on its obligations to A, absent a default by C, then the problem is one of (financial) liquidity. An example of the former case would be if A lends \$100 to B for one year who in turn lends the \$100 to C for one year, and C makes a bad investment and then has not the funds to repay B a year hence, who, as a consequence, has

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not the funds to pay A, a year hence, both defaults are the result of credit problems.

An example of the latter case would be if A lends \$100 to B for one year, who in turn lends the \$100 to C for two years, interest payable monthly, and principal payable at the end of the two year term. With C performing strictly in accord with the terms of its note to B, at the end of one year A wants to be repaid the \$100 rather than rolling the note over (with the interest rate adjusted in accord with then current market conditions). If B is unable to borrow \$100 from another A, say A', to repay the first A, B defaults on its obligations to A, then the problem is one of (financial) liquidity. Note that a liquidity problem can only arise if the term for which B has borrowed the funds from A is shorter than the term for which he lends the funds to C; i.e., in cases where B borrows short and lends long. A liquidity problem cannot arise in a situation where B borrows long and lends short.

To reiterate, in *any* credit transaction there is an ex ante risk that the debtor will be default on his obligation(s); i.e., be a credit risk. For example, if A lends directly to C, it is possible C will default. Or, in an intermediated transaction, A lends to B, the financial intermediary, and B lends to C. Again, in such cases, C may default on its obligation to B. Whether or not B will, in turn, default upon its obligation to A depends upon a number of factors. In any of these cases, if A does not receive his due, it is because the credit risk materialized. The problem is one of credit not liquidity. And, only in financially-intermediated-credit transactions involving inter temporal mismatches in which B's note¹³ to A matures before C's note to B, can a liquidity problem arise.

5. Financial and real liquidity

Liquidity is a characteristic of an asset that refers to the rapidity with which it can be redeployed, either directly or indirectly, into another, more valuable use, taking into account any change in value from the redeployment. Virtually all definitions of liquidity treat it in terms of a monetary economy, and define it as the ability to convert an asset into money, rapidly, and without loss of pecuniary value. Money, itself, then is

¹³ "Note" is used generically throughout to refer to any type of credit instrument.

considered to be the most liquid of assets.¹⁴ However, some economists, including the present authors, consider liquidity a relevant concept in a barter economy, also.¹⁵

In a monetary society, the liquidity of a financial asset means the ease with which it can be exchanged for money, the most liquid of all assets. There are two aspects to this: price and time. The owner of an asset who wishes to sell it has in mind a (present) pecuniary value for it. The longer it takes before he can sell it at that price or the greater the shortfall in the price he must accept for a quick sale, the less liquid it is to him. Because different assets have different characteristics and are traded in markets with different characteristics, some are said to be more or less liquid than others. Obviously, liquidity is continuous in nature; moreover, it is subjective in nature and thus is not, and cannot be measured, objectively. Note that the underlying aspect of liquidity is opportunity cost. So with a financial asset the foregone alternative is the (subjective value of the) expected present value of the proceeds from a sale thereof. And, the higher the opportunity cost, the greater the liquidity.

Every society, monetary or based on barter, has a stock of real assets. Regarding real assets, the meaning of liquidity is ambiguous. For, in these cases, the opportunity cost may not be the value from a trade, but rather the value from an alternative use; e.g., converting a building from apartments to condominiums or a warehouse to apartments. Therefore, liquidity has meaning even in a barter economy and refers to how quickly the value of a real asset may be realized.¹⁶

At any point in time there exists within any society a structure of more and less durable goods that constitutes that society's structure of production

¹⁴ This is not universally correct. Even in a society with a fiat money, such as the U.S.A., there are multiple monies in the sense that a U.S. penny, a \$1.00 Federal Reserve Note (FRN) and a \$100.00 FRN are each money, but, nevertheless, different. In that case a particular money may not be very liquid: try buying a new car with pennies or a can of Coca-Cola® with a \$100.00 FRN.

¹⁵ For example, Keynes (1936, 239-242). Has a concept of liquidity in a "non-monetary" economy. See footnote 15, *infra*.

¹⁶ Keynes (1936, 240) has a different concept of the liquidity of real assets: "In [a 'non-monetary'] economy capital equipments will differ from one another ... in the rapidity with which the wealth embodied in them can become 'liquid', in the sense of producing output, the proceeds of which can be re-embodied if desired in quite a different form."

and consumption.¹⁷ Unless there is a significant, non-offsetting change in the individual preferences of the members of that society, including time preferences, or significant changes in technology that substantially increase the versatility of goods, the liquidity of the stock of real goods is relatively fixed in the short run.^{18, 19} However, the liquidity preferences of individuals in terms of the financial assets they own can be volatile in the (very) short run, and increase dramatically very quickly. Keynes was, of course, correct when he said that that ‘everyone’ cannot increase their liquidity simultaneously (1936, 160). He also held that the attempt to do so is very disruptive to financial markets with attendant consequences for the real economy. But this latter claim is only true when market flexibility is abrogated by government regulations that render price and wage alterations

¹⁷ Orthodox Austrian Economics concerns itself only with the structure of production, although see Hayek (1935, 11, 54), Hayek (1932, 241, n2), Hayek (1978, 212-213) and Garrison (2001, 47-49).

¹⁸ Although liquidity is subjective, it is safe to say that in general a pickup truck is more liquid than a locomotive, as it can more readily be shifted to alternative uses. Similarly for hand-tools compared to oil tankers. Thus a change in technology that would substantially increase the versatility of locomotives or oil tankers would increase the liquidity of the society whose members owned these capital goods. However, the structure of assets, both capital goods and durable consumers’ goods, in a society was/is designed to produce a stream of consumers’ goods, including services, that is in accord with the preferences, including the time (and liquidity) preferences, of the members of that society. If peoples’ preferences change in non-offsetting ways then the current structure of assets will be less well suited to producing the newly preferred consumers’ goods. Therefore, the asset structure of that society will be less liquid in that it will not be able to convert resources into the newly preferred consumers’ goods as quickly and with as much value as it was previously able to convert resources into the consumers’ goods preferred prior to the changes in preferences. Regarding time preferences, this same analysis holds for non-offsetting increases in time preferences, and for non-offsetting decreases in time preferences. However, this does not hold in the latter case if the preferences shift only with respect to the timing of the preferences for consumers’ goods and not for the types thereof, if such preference changes are with respect to durable consumers that that can be stored at zero resource cost for the entire period of time by which the time preferences have changed.

¹⁹ Generally speaking, poor societies’ structures of goods are probably less liquid than those of wealthier economies. In modern societies, there are opposing forces at work re liquidity of real goods. In some cases productivity is best promoted by highly specialized machines; e.g., elevators; whereas in others it is best promoted by highly versatile machines; e.g., pickup trucks.

more difficult. Moreover, there is no reason to think that such behavior would occur in a free market economy.

6. *Financial intermediation and ABC*

Austrians have long understood that lending new (fiat) money into existence via a fractional-reserve banking system results in or causes a misallocation of resources. It does so by forcing interest rates below the level they otherwise would have been. This induces an increase in borrowing that is used to unwittingly²⁰ malinvest. At the same time it leads to a reduction in voluntary saving. In consequence, the necessary equality of investment and saving is brought about by forced saving that fills the gap between the increased investment and the decreased voluntary saving. That is, the increased investment in the form of malinvestment is the flip side of the increased saving in the form of forced saving or: malinvestment \equiv forced saving (Block and Barnett, 2007).

However, fractional-reserve banking is but a special case of the more general inter temporal-carry trade. In the general case, B borrows money from A for a fixed, non-zero period of time and then re-lends the funds to C for a longer period of time, whereas in the case of fractional-reserve banking B borrows money from A and agrees to repay A instantaneously on demand by A, and then re-lends the funds to C for a longer period of time. In both cases, the loan to C is for a greater period than the loan to B. In either the general or the special case, a fractional-reserve bank, B must repay A before he, B, is repaid by C.

The normal case is that interest rates on shorter-term loans are lower than those on longer-term loans, *ceteris paribus*. The reasons for this are: 1) the default risk is greater on longer-term loans; and, 2) longer-term loans must bear a liquidity premium relative to shorter-term loans, as lenders face uncertainty as to when they will want to use the funds loaned, and the longer the period of the loan the greater the likelihood they would like to

²⁰ Is it always “unwittingly?” Or is it sometimes knowingly with the expectation of “front-running?” For the view that, absent the full rational expectations model of perfect future knowledge (a logical contradiction, since we cannot know what we will know in the future, otherwise we would already know it), the misallocation can be “witting,” or made “wittingly,” see Block (2001)

have them back before the loan matures. Consequently, the term-structure of interest rates is almost always an increasing function of time. It is this spread between the lower, shorter-term rates at which the intermediary borrows and the higher, longer-term rates at which it lends, that provides the margin for intermediaries to cover their expenses and earn a profit.

In reality, financial liquidity must be the same as real liquidity, just as saving must equal investment. In either case they are but two different manifestations of the same underlying thing, the latter dealing with the allocation of resources and the former with the pecuniary valuation thereof; i.e., the former with prices and the latter with quantities.

Although not deduced from an apodictic truth, it is quite clear that there is, in the aggregate, a conflict between people's time preferences as lenders and as borrowers. That is, they prefer (in the thymological sense)²¹ that the financial assets they buy be (much) more liquid than those that they sell. Were it not true, there would be no intertemporal carry trade. People who wanted to borrow long would find people who want lend long and people who want to borrow short would find people who want to lend short. And, if intermediaries were used for matching purposes, only, the interest rate spread between that paid by B to borrow from A and then lend to C for the same time period would narrow to cover only the administrative expenses of the intermediation function, including a reasonable profit, and any perceived difference in credit risk between B and C. It would not have to have a premium to cover liquidity risk. Of course, that is a logical impossibility – it is like trying to square a circle. Moreover, any attempt to do so is bound to cause frustration and waste scarce resources.²² And, yet, that is precisely what the inter temporal-carry trade attempts to do, with serious consequences for macroeconomic stability; i.e., it is the root cause of Austrian business cycles.

Absent financial intermediaries, all credit would be direct between A and C. There could be no inter temporal mismatch of the term-to-maturity of credit. However, the presence of intermediaries facilitates such mismatches;

²¹ Another thymological, but not praxeological relationship in Austrian economics concerns that between wealth and time preference. They tend to be inversely related, but this is not a necessary association. See on this Block, Barnett and Salerno, 2006.

²² Waste here is used in the Misesian sense; i.e., although as a science economics eschews value judgments, it is scientific to note that certain actions can not possibly achieve the ostensible end(s) thereof.

indeed, makes them possible. Now, A can lend funds for shorter periods and C can borrow those same funds for longer periods. The essence of our thesis is that the inter temporal-carry trade, whether of the fractional-reserve-demand-deposit type or of the (improperly matched) time-deposit type, creates time ex nihilo; that is, it creates out of the thin air the period of time that constitutes the difference between the lending period of A and the borrowing period of C. But the efforts to bring about this logical impossibility result in the misallocation of resources of the Austrian business cycle type.

Were it not for intermediation, the voluntary interactions of A and C in the market-place would result in an increase in the average term-to-maturity of loans made by A and a decrease in the average term-to-maturity of loans received by D. In fact, there would be, could be, no spread between them.²³ However, as C's desired term-to-maturity decreased, they would not be willing to pay interest rates as high as for longer-term loans. And because A's desired term-to-maturity increased they would not be willing to accept interest rates as low as for shorter term loans. This would result in a decrease in forced saving and an increase in voluntary saving on the one hand and a fall in both investment and malinvestment.²⁴

Here, the relationship is a logical necessity. It is important to remember that investment and saving have two dimensions, each: a quantity dimension, say \$, and a time dimension, for example years. The elimination of the time carry would eliminate both the forced saving and the malinvestment, which are but two different perspectives of the same phenomena. However, as we state, *supra*, the average period of a loan by A would rise, increasing the time dimension of (voluntary) saving and thus escalating saving; and, the average period of a loan to C would decrease, reducing the time dimension of investment, and thus diminishing investment. Another way of looking at it is that absent the intermediary, both A and C would find that, on average, the terms they were offered in the credit markets were less desirable. In order to clear the credit markets A

²³ In reality, some intermediaries would continue to perform the other intermediary functions for which they would either have to have an interest rate spread or charge fees.

²⁴ Saving and investment have (at least) two dimensions: a quantity dimension and a time dimension. Financial saving of \$100 dollars for one year is less than financial saving of \$100 for two years. Therefore, voluntary saving can increase without the quantity increasing if the average term-to-maturity of loans increases.

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would have to lend for longer terms and C would have to borrow for shorter terms than with the intermediaries' services. These changes in the time dimensions would increase saving and decrease investment. That is, with B in the middle A lent \$1.00 for 1 year, at 5%, which is a saving/loan of \$1.00-1 year; whereas C borrowed the \$1.00 for 2 years, at 10%, which is an investment/loan of \$1.00-2 year.²⁵ Without B, A would have lent \$1.00 at 7.5% to C for 1.5 years. Both saving/loan and investment/loan would now be equal at \$1.00-1.5 year. That would be an increase in saving of \$1.00-0.5 year and a decrease in investment of the same amount. Note that with B involved, forced saving of \$1.00-0.5 year = malinvestment of \$1.00-0.5 year. Why is that? Because total investment must equal total saving. And total investment, including malinvestment, with B involved, is \$1-2year. But total investment without B is \$1.00-0.5 years. Therefore, malinvestment equals \$1.00-0.5 year and, as we know forced saving equals malinvestment. Q.E.D.

This analysis leads inexorably to the conclusion that in addition to fractional-reserve (demand) banking, *any* mismatched inter temporal-financial intermediation of the borrow short and lend long sort, causes resource misallocations, and if they are of sufficient magnitude (Block and Barnett, unpublished) an ABC. Put differently, even in a monetary/banking system based on gold with 100% reserves required against demand deposits, improperly matched (short lending, long borrowing) intertemporal-financial intermediation involving time deposits, would, if of substantial amount, give rise to Austrian type business cycles. Neither fiat money nor fractional-reserve banking are necessary for ABCs, although fractional-reserve-demand deposit banking is sufficient for ABCs.

²⁵ In contradistinction to the International System of Units, these can not be combined into derived dimensions. For example, in the equation for force, $F = ma$, a mass of 3kg accelerated at a rate of 2ms^{-2} = a mass of 2kg accelerated at a rate of 3ms^{-2} = 6n. However of a loan of \$3.00 for 2 years is a quite different thing from a loan of \$2.00 for 3 years. And, neither is equal to a loan of \$6.00- for 1 year.

7. *Can fraudulent time deposits lead to an Austrian Business Cycle? Yes*

At first glance, one would suppose that mismatched time deposits²⁶ cannot lead to an ABC. Why not? Because they do not increase the amount of money in circulation, and mainstream Austrian Business Cycle Theory (ABCT) is predicated on precisely that as a causal antecedent.²⁷

However there is more than one way to skin a cat. When government creates additional money, by lending it into existence in a credit market,²⁸ to be sure, this sets the stage for the ABC. But this is only a sufficient condition, not a necessary one. There is yet another roadway into the ABC: when banks or other financial intermediaries borrow short and lend long.

In order to see this, let us suppose that there were no time deposit banks to serve as intermediaries, and borrowers and lenders had to deal with one another directly. Posit that there is a potential supplier of funds who is willing to do so for 3% per year for a two year loan, Mr. A; he wishes to lend “short.” Then, there is Mr. C, who would like the use of this amount for money for a period of 10 years; i.e., he wishes to borrow “long,” and is willing to offer 5%.²⁹ If there were a mismatching time deposit bank in the picture, that would pretty much be the end of our little story: assuming C to be a good credit risk and the 200 basis points to be a sufficient spread to cover the intermediaries’ expenses and a reasonable profit. But there is not, so the only way A and C may be able to reach an agreement is by negotiating with each other.

What happens then? Possibly, C raises his interest rate offer to, say, 7%; if this is insufficient, then to 9% or 11%. Whereupon A, or another low time preference potential lender, takes the bait. Say, they settle at 9%. Or, A offers to lend for say seven years at, say, 4% and C accepts the offer. A is

²⁶ Mismatched time deposits refers to the type of financial intermediation in which the financial intermediary “borrows short and lends long.”

²⁷ See on this Barnett and Block, 2005, 2006; Block, 2001; Block and Garschina, 1996; Carilli and Dempster, 2001; Garrison, 1994, 2001, 2004; Garrison and Bellante, 1988; Hayek, 1935; Mises, 1998; Rothbard, 1993.

²⁸ In the U.S. this is done by the Federal Government's bastard child, the Federal Reserve System.

²⁹ We choose a higher interest rate for longer durations, since, *ceteris paribus*, there is a greater risk of non payment, as well as necessarily, greater loss of liquidity, which we assume is a positive benefit.

willing to extend the period of the loan for a higher rate and C is willing to borrow for a shorter period at a lower rate.

But this means that interest rates for any loan of any given length of time will be higher than they otherwise would be in this scenario. Or, to take the obverse perspective, we can infer that upon the entry of the mismatched time deposit bank, interest rates for any loan of any given length of time will be *lower* than would otherwise prevail.³⁰ However, lowering interest rates below the level that would otherwise obtain, is, certainly, a causal element in the ABC.

8. *Conclusion*

We full well realize that our thesis is not fully compatible with “classical” ABCT.³¹ There, fractional reserve banking is both necessary and sufficient to bring about the ABC. In our view, in contrast, FRB is only sufficient to this end. Another phenomenon, not unrelated to the first, is *also* sufficient (although not necessary): mismatched time deposits. These, *too*, as we have demonstrated, can artificially lower interest rates below levels that would otherwise occur. Because the ABC consists in the unsustainable, systematic misallocation of resources consequent on such artificially lower interest rates, this paper constitutes an extension of ABCT.

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³⁰ See Hulsmann (2003) for the view that economics largely consists of making such contrary to fact claims.

³¹ We confess: we love that phrase.

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