4

The Credit Expansion Process

This chapter and the following five comprise an analysis of the *economic* consequences of violating the general legal principles inherent in the irregular deposit contract. We examined the legal and historical consequences of such violations in chapters 1, 2, and 3 and will now focus on the process by which banks create loans and deposits from nothing and on the different implications this process has for society. The most serious consequence of banks' creation of loans is the following: to the extent loans are granted without the corresponding backing of voluntary saving, the real productive structure is inevitably distorted and recurrent economic crises and recessions result. We will explain the circulation credit theory of the business cycle and then critically analyze the macroeconomic theories of monetarism and Keynesian economics. In addition we will carry out a brief review of the recurring economic crises which have thus far assailed the world. The first of the two final chapters contains a theoretical study of central banking and free banking, and the second consists of an examination of the proposal of a 100-percent reserve requirement for banking.

1 Introduction

The economic theory of money, banking, and business cycles is a relatively recent development in the history of economic

thought. This body of economic knowledge has followed the relevant events (the development of fractional-reserve banking and the recurring cycles of boom and recession) and corresponding legal formulations with *great delay*. As we have seen, the study of legal principles, the analysis of their loopholes and contradictions, the search for and correction of their logical defects, etc. took place much earlier in history and can even be traced back to classical Roman legal doctrine. In any case, in keeping with the evolutionary theory of institutions (legal, linguistic, and economic), according to which institutions emerge through a lengthy historical process and incorporate a huge amount of information, knowledge, and experience, the conclusions we will reach through our economic analysis of the monetary bank-deposit contract in its current form are hardly surprising. They largely coincide with and support inferences the reader may have already drawn (from a purely legal standpoint) in preceding chapters.

Our analysis of banking will be limited to the study of the monetary deposit contract, which in practice applies to so-called demand checking accounts, savings accounts and time deposits, whenever the last two permit the *de facto* withdrawal of the balance by the customer at any time. Hence, our study excludes numerous activities private banks presently engage in which are in no way related to the monetary irregular-deposit contract. For example, modern banks offer their customers *bookkeeping* and *cashier services*. They also buy and sell foreign currencies, following a *money-changing* tradition that dates back to the appearance of the first monetary units. In addition, banks accept *deposits of securities* and on behalf of their clients collect dividends and interest from the issuers, informing customers of increases in owner's equity, stockholders' meetings, etc. Moreover, banks *buy and sell securities* for their clients through discount houses and offer *safe deposit box* services at their branches. Likewise, on many occasions banks act as *true financial intermediaries*, attracting loans from their customers (that is, when customers are aware they are providing a loan to the bank, as holders of bonds, certificates, or true time "deposits") and then lending those funds to third parties. In this way, banks derive a profit from the *interest rate*

differential between the rate they receive on loans they grant and the one they agree to pay to customers who initially give loans to them. None of these operations constitutes a monetary bank-deposit, a transaction we will examine in the following sections. As we will see, this contract undoubtedly represents the most significant operation banks carry out today and the most important from an economic and social standpoint.

As we have already pointed out, an economic analysis of the monetary bank-deposit contract provides one more illustration of Hayek's profound insight: whenever a universal legal principle is violated, either through systematic state coercion or governmental privileges or advantages conferred on certain groups or individuals, the spontaneous process of social interaction is inevitably and seriously obstructed. This idea was refined in parallel with the theory of the impossibility of socialism and has spread. Whereas at one point it was only applied to systems of so-called real socialism, it has now also come to be associated with all parts or sectors of mixed economies in which systematic state coercion or the "odious" granting of privileges prevails.

Although the economic analysis of interventionism appears to pertain more to coercive governmental measures, it is no less relevant and illuminating with respect to those areas in which traditional legal principles are infringed via the granting of favors or privileges to certain pressure groups. In modern economies there are two main areas where this occurs. Labor legislation, which thoroughly regulates employment contracts and labor relations, is the first. Not only are these laws the basis for coercive measures (preventing parties from negotiating the terms of an employment contract as they see fit), they also confer important privileges upon pressure groups, in many ways allowing them to act on the fringes of traditional legal principles (as unions do, for instance). The second area in which both privileges and institutional coercion are preponderant is the general field of money, banking, and finance, which constitutes the main focus of this book. Although both areas are very important, and thus it is urgent that both be theoretically examined in order to introduce and

carry through the necessary reforms, the theoretical analysis of institutional coercion and the granting of privileges in the labor field is clearly less complex. As a result, the awareness it arouses has spread faster and penetrated deeper at all levels of society. Related theories have been significantly developed and broad social consensus has even been reached regarding the need for reforms and the direction they should take. In contrast, *the sphere of money, bank credit and financial markets remains a formidable challenge to theorists and a mystery to most citizens.* Social relationships in which money is directly or indirectly involved are by far the most abstract and difficult to understand, and as a result the related knowledge is the most vast, complex, and elusive. For this reason, systematic coercion in this area by governments and central banks is by far the most harmful and pernicious.[1] Furthermore, the insufficient formulation of monetary and banking theory adversely affects the development of the world economy. This is evidenced by the fact that, despite theoretical advances and government efforts, modern economies have yet to be freed of recurring booms and recessions. Only a few years ago, despite all the sacrifices made to stabilize western economies following the crisis of the 1970s, the financial, banking and monetary field was invariably again plagued by the same reckless errors. As a result, the beginning of the 1990s marked the inevitable appearance of a new worldwide economic recession of considerable severity, and the western economic world has only

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1 The operation of the money and credit structure has, . . . with language and morals, been one of the spontaneous orders most resistant to efforts at adequate theoretical explanation, and it remains the object of serious disagreement among specialists. . . . [S]elective processes are interfered with here more than anywhere else: selection by evolution is prevented by government monopolies that make competitive experimentation impossible. . . . The history of government management of money has . . . been one of incessant fraud and deception. In this respect, governments have proved far more immoral than any private agency supplying distinct kinds of money in competition possibly could have been. (Hayek, *The Fatal Conceit*, pp. 102–04)

recently managed to recover from it.[2] And once again, more recently (in the summer of 1997), an acute financial crisis devastated the chief Asian markets, threatening to spread to the rest of the world. Few years later (since 2001) the three main economic areas of the world (the United States, Europe, and Japan) have simultaneously entered into a recession.

The purpose of the economic analysis of law and legal regulations is to examine the role the latter play in the spontaneous processes of social interaction. Our economic analysis of the monetary bank-deposit contract will reveal the results of applying traditional legal principles (including a 100-percent reserve requirement) to the monetary irregular-deposit contract. At the same time, it will bring to light the damaging, unforeseen consequences that follow from the fact that, in violation of these principles, bankers have been permitted to make self-interested use of demand deposits. Until now these effects have gone mainly unnoticed.

We will now see how bankers' use of demand deposits enables them to *create* bank deposits (that is, money) and in turn, loans (purchasing power transferred to borrowers, whether businessmen or consumers) *from nothing*. These deposits and loans do not result from any real increase in voluntary saving by social agents. In this chapter we will concentrate

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[2]It is also interesting to note that the monetary and financial excesses which provoked this crisis stemmed mainly from the policies applied in the latter 1980s by the supposedly neoliberal administrations of the United States and the United Kingdom. For example, Margaret Thatcher recently acknowledged that the key economic problem of her term in office originated "on the 'demand side' as money and credit expanded too rapidly and sent the prices of assets soaring." See Margaret Thatcher, *The Downing Street Years* (New York: HarperCollins, 1993), p. 668. In addition, in the field of money and credit, the United Kingdom merely followed the process of irresponsibility that had been initiated in the United States during the second Reagan administration. If possible, these events indicate even more plainly the importance of advancing theory to prevent other political authorities (even those with pro free-market views) from committing the same errors as Reagan and Thatcher and to allow them to clearly identify the type of monetary and banking system appropriate for a free society, something many people with a laissez-faire stance remain distinctly unsure about.

on substantiating this assertion and some of its implications and in subsequent chapters will undertake the study of the economic effects of credit expansion (the analysis of economic crises and recessions).

To continue the pattern set in the first chapters, we will first consider the effects from an economic and accounting perspective in the case of the loan or mutuum contract. In this way, by comparison, we will be better able to understand the economic effects of the essentially distinct monetary bank-deposit contract.

2
The Bank's Role as a True Intermediary in the Loan Contract

Let us begin by supposing a banker receives a loan of 1,000,000 monetary units (m.u.) from a customer. A true legal loan contract exists, stipulating that the customer is to give up the availability of 1,000,000 m.u. in the form of present goods (money) he could have spent, and that he is to do so for a period of time or term (the essential element of any loan contract) lasting one year. In exchange for these present goods, the banker agrees to return after one year a larger quantity than that originally received. If the agreed-upon interest rate is 10 percent, at the end of one year the banker will have to return 1,100,000 monetary units. The following book entry is made when the loan is received:

(1) Bank A

Debit		Credit	
1,000,000 m.u. Cash		Loan received	1,000,000 m.u.
(Input in the bank's cash asset account)		(Increase in liabilities)	

Economically speaking, this contract clearly involves a simple exchange of present goods (the availability of which is transferred from the lender to the bank) for future goods (which Bank A agrees to turn over to the lender at the end of one year). *Therefore, from a monetary standpoint there is no change.* A certain number of monetary units simply cease to be available to the lender and become available to the bank (for a predetermined period of time). A mere transfer of 1,000,000 m.u. takes place, without any resulting variation in the total number of preexisting monetary units.

We could view entry (1) as the journal entry made the day the contract is signed and 1,000,000 m.u. are handed over to the bank by the lender. We could also see it as Bank A's balance sheet, drawn up immediately following the transaction and registering on the left side (the asset side) 1,000,000 m.u. in the cash account and on the right side (the liability side) the debt of 1,000,000 m.u. contracted with the lender.

Let us also suppose that Bank A carries out this operation because its managers plan in turn to loan 1,000,000 m.u. to Business Z, which urgently needs the money to finance its operations and is willing to pay 15 percent interest per year for the loan of 1,000,000 m.u. from Bank A.[3]

When Bank A loans the money to Business Z, an entry in Bank A's journal is made to reflect the output of 1,000,000 m.u. from the cash account and Business Z's debt to the bank, replacing the original cash asset. The entry is as follows:

(2) Bank A

Debit		Credit	
1,000,000	Loan granted (Accounts receivable)	Cash	1,000,000 (Output from cash account)

[3]We could likewise have assumed that Bank A used the money to grant consumer loans or short-term loans to trade, as occurs when bills are discounted three, six, nine and twelve months before maturity. The consideration of these uses is irrelevant to our analysis, however.

In this case Bank A clearly acts as a *true financial intermediary*. Its managers recognize and take advantage of a business opportunity.[4] Indeed, they see a chance to make a profit, since at one place in the market there is a lender willing to loan them money at 10 percent interest, and at another Business Z is willing to take out a loan at 15 percent, leaving a profit differential of 5 percent. Therefore, the bank acts as intermediary between the original lender and Business Z, and *its social function consists precisely of recognizing the existing disparity or lack of coordination* (the original lender wished to loan his money but could not find a creditworthy borrower willing to take it, while Business Z urgently needed a loan of 1,000,000 m.u. and its managers did not know where to find a suitable lender). The bank, by obtaining a loan from one and granting a loan to the other, satisfies the subjective needs of both and derives a *sheer entrepreneurial profit* in the form of the interest differential of 5 percent.

At the end of a year, Business Z will return the 1,000,000 m.u. to Bank A, together with the agreed-upon 15 percent interest. The entries are as follows:

(3) Bank A

Debit		Credit	
1,000,000	Cash	Loan granted (Repayment)	1,000,000
150,000	Cash	Interest received from Business Z (Revenue for the year)	150,000

[4]On the essence of entrepreneurship, consisting of discovering and taking advantage of opportunities for profit, and on the sheer entrepreneurial profit that results, see chapter 2 of Huerta de Soto, *Socialismo, cálculo económico y función empresarial*, pp. 41–86.

Soon afterward, Bank A must in turn honor the contract it entered into with the original lender, returning to him the 1,000,000 m.u. its managers had committed to pay at the end of one year, along with 10 percent interest. The entries are as follows:

(4) Bank A

Debit		Credit	
1,000,000	Loan received (Repayment)	Cash	$1,000,000
100,000	Interest payment (Expenses for the yea	Cash	$100,000

In other words, the bank repays the loan, records the output from its cash account of the 1,000,000 m.u. received from Business Z and adds to that sum the 100,000 m.u. (also charged to the cash account) in agreed-upon interest it pays the original lender. On the bank's income statement, this interest is registered as a charge in the form of interest payments made during the year.

After these entries, at the end of the year, the bank's income statement would appear as follows:

(5) Bank A
Income Statement
(During the Year)

Expenses		Revenues	
Interest paid	100,000	Interest Received	150,000
Net income	50,000		
Total Debit	150,000	Total Credit	150,000

This income statement reflects an entrepreneurial profit for the year of 50,000 m.u., a net income derived from the difference between the year's revenue (150,000 m.u. in interest received) and the year's expenses (100,000 m.u. in interest paid).

At the end of the year, Bank A's balance sheet would appear as follows:

(6)

Bank A
Balance Sheet
(End of the year)

Assets		Liabilities	
Cash	50,000	Owner's equity (Profit for the year)	50,000
Total Assets	50,000	Total Liabilities	50,000

If we look at the balance sheet drawn up at the very end of the year, we see that the bank's assets include 50,000 m.u. available in the cash account that correspond to the year's profit, which has been placed in the corresponding owner's equity account (capital and retained earnings) under Liabilities.

The following points recapitulate our description in accounting terms of a banking activity based on receiving and granting a loan or mutuum: *one,* for one year the original lender relinquished the availability of 1,000,000 m.u, present goods; *two*, the availability of this money was transferred to Bank A for exactly the same time period; *three*, Bank A discovered an opportunity to make a profit, since its managers knew of a borrower, Business Z, which was willing to pay a higher interest rate than the one the bank had agreed to pay; *four*, the bank granted a loan to Business Z, relinquishing in turn the availability of 1,000,000 m.u. for one year; *five*, Business Z obtained the availability of the 1,000,000 m.u. for one year in order to expand its activities; *six*, therefore, for the period of one year, the number of m.u. did not vary, as they were simply transferred from the original lender to Business Z via the

intermediary—Bank A—; *seven*, in the course of its activities, Business Z brought in a profit enabling it to make the interest payment of 150,000 m.u. (these 150,000 m.u. do not represent any money creation, but are simply obtained by Business Z as the result of its sales and purchases); *eight*, at the end of one year, Business Z returned 1,000,000 m.u. to Bank A, and Bank A paid the same amount back to the original lender, along with 100,000 m.u. in interest; *nine*, as a result, Bank A obtained an entrepreneurial profit of 50,000 m.u. (the difference between the interest it paid the original lender and the interest it received from Business Z), a sheer entrepreneurial profit resulting from its legitimate business activity as intermediary.

As is logical, Bank A could have been mistaken in its choice of Business Z. It could have miscalculated the risk involved, or the ability of Business Z to return the loan and pay the interest. Therefore, the success of the bank's activity in this case depends not only upon its bringing the operation with Business Z to a successful conclusion, but also on its own obligation (to return to the original lender 1,000,000 m.u. plus 10-percent interest) falling due *after* Business Z repays the loan to the bank, along with 15-percent interest. In this way the bank can maintain its solvency and avoid any unfortunate incidents. Nevertheless, like any other business, banks are subject to possible entrepreneurial error. For example, Business Z could be unable to return on time the amount it owes the bank, or it could even suspend payments or go bankrupt, which would render Bank A insolvent as well, since it would be unable to in turn pay back the loan it received from the original lender. However, this risk is no different from that inherent in any other business activity and can be easily reduced through the use of prudence and deliberation by the bank in its business activities. Moreover, for the length of the operation (throughout the year), the bank remains fully solvent and faces no liquidity problems, *since it has no obligation to make any cash payments for as long as its loan contract with the original lender remains in force*.[5]

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[5]Murray N. Rothbard, in reference to banks' role as true intermediaries between original lenders and final borrowers, states:

3
The Bank's Role in the Monetary Bank-Deposit Contract

The economic events and accounting procedures involved in the monetary bank-deposit contract are substantially different from those examined in the preceding section, on the loan or mutuum. (We covered the loan contract first in order to better illustrate by comparison the essential differences between the two contracts.)

In the case of a *regular* (or sealed) deposit of a certain number of perfectly and individually marked monetary units, the person receiving the deposit need not record anything under Assets or Liabilities, because no transfer of ownership occurs. However, as revealed by our study of the legal essence of the *irregular* (or open) deposit contract, this second contract represents a deposit of fungible goods, in which it is impossible to distinguish between the individual units deposited, and therefore a certain transfer of "ownership" does take place. This occurs in the strict sense that the depositary is not obliged to return the very same units received (which would be impossible, given the difficulty of specifically identifying the units of a fungible good received), but others of equal quantity and quality (the *tantundem*). Nevertheless, even though a

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> [t]he bank is expert on where its loans should be made and to whom, and reaps the reward of this service. Note that there has still been no inflationary action by the loan bank. No matter how large it grows, it is still only tapping savings from the existing money stock and lending that money to others. If the bank makes unsound loans and goes bankrup,t then, as in *any* kind of insolvency, its shareholders and creditors will suffer losses. This sort of bankruptcy is little different from any other: unwise management or poor entrepreneurship will have caused harm to owners and creditors. Factors, investment banks, finance companies, and money-lenders are just some of the institutions that have engaged in loan banking. (Murray N. Rothbard, *The Mystery of Banking* [New York: Richardson and Snyder, 1983], pp. 84–85)

transfer of ownership may be established, *availability* is not transferred to the depositary, because in the irregular deposit contract he is obliged to continuously safeguard the *tantundem* of the deposit and therefore must always maintain available to the depositor units of an equal quantity and quality as those originally received (though they may not be the same specific units). Hence, the only justification a depositary has for entering a deposit contract in his account books lies precisely in the transfer of ownership entailed by the irregulardeposit; however, it is important to point out that given the extremely limited sense in which this transfer of ownership occurs (it is not at all equal to a transfer of availability), at most the information should be recorded in mere "memorandum accounts" with purely informative purposes. Let us imagine that we have traveled back in time to the dawn of fractional-reserve banking and that a depositor, Mr. X, decides to deposit 1,000,000 m.u. in Bank A (or if you prefer, any person today decides to open a checking account in a bank and deposit 1,000,000 m.u.). This second case involves a true deposit contract, though an irregular one, given the fungible nature of money. In other words, the essential cause or purpose of the deposit contract is the desire of Depositor X that Bank A *safeguard* the 1,000,000 m.u. for him. Mr. X believes that, despite having opened the checking account, he retains the *immediate availability* of 1,000,000 m.u. and can withdraw them at any time for whatever use he pleases, since he has made a "demand" deposit. *From an economic standpoint, for Mr. X the 1,000,000 m.u. are fully available to him at all times and therefore contribute to his cash balances*: that is, even though the monetary units were deposited in Bank A, from a subjective viewpoint they remain as available to Mr. X as if he carried them in his pocket. The entry corresponding to this irregular deposit is as follows:

Bank A

(7)	Debit		Credit	
	1,000,000 Cash		Demand deposit (made by Mr. X)	1,000,000

(This should be a mere memorandum entry.)

We see that, although Bank A is justified in making this book entry, since it becomes owner of the monetary units and stores them in its safe without distinguishing them from others, the reference entries should only affect information or memorandum accounts. This is due to the fact that, though the ownership of the monetary units has been transferred to the bank, *it has not been completely transferred*, but remains totally restricted, in the sense that Depositor X still possesses the full availability of the monetary units.

Apart from this last observation, nothing unusual has yet happened from an economic or accounting standpoint. A Mr. X has made an irregular deposit of money in Bank A. *Up to now* this contract has not resulted in any modification of the quantity of money in existence, which continues to be 1,000,000 m.u. and remains available to Mr. X who, for his own convenience, has deposited it in Bank A. Perhaps depositing the money is convenient for Mr. X because he wishes to better safeguard his money, avoiding the dangers that await it in his own home (theft and losses), and to receive cashier and payment services from the bank. In this way Mr. X avoids having to carry money in his pocket and can make payments by simply writing a sum down on a check and instructing the bank to send him a summary each month of all the operations carried out. These banking services are all very valuable and warrant the decision of Mr. X to deposit his money in Bank A. Furthermore, Bank A is fully justified in charging the depositor for these services. Let us suppose the agreed-upon price for the services is 3 percent per year of the quantity deposited (the bank could also charge a flat rate unrelated to the amount deposited, but for the purpose of illustration we will assume the cost of the services depends on the entire amount deposited), a sum with which the bank can cover its operating costs and also achieve a small profit margin. If we suppose the operating costs are equivalent to 2 percent of the amount deposited, the bank will obtain a profit of 1 percent per year, or 10,000 m.u. If Mr. X pays this annual fee (30,000 m.u.) in cash, the following book entries would result from the rendering of the above-mentioned services:

Bank A

(8) Debit		Credit	
30,000 Cash		Income from Client X in payment for services	30,000
20,000 Operating expenses paid by the bank in order to offer its services		Cash	20,000

At the end of the year, Bank A's income statement and balance sheet would be as follows:

(9)

Bank A
Income Statement
(During the year)

Expenses		Revenues	
Operating costs	20,000	Income from services rendered	30,000
Net Income	10,000		
Total Debit	30,000	Total Credit	30,000

Balance Sheet
(End of the year)

Assets		Liabilities	
Cash	1,010,000	Owner's equity (Profit for the year)	10,000
		Demand deposit	1,000,000
Total Assets	1,010,000	Total Liabilities	1,010,000

As we see, up to now there has been nothing unusual or surprising about the economic events or accounting processes resulting from the monetary irregular-deposit contract. The bank has made a small legitimate profit, derived from its role as a renderer of services valued by its customer at 30,000 m.u. Moreover, there has been no change in the quantity of money, and after all of the transactions, the bank's cash account has only increased by 10,000 m.u. This sum corresponds to the pure entrepreneurial profit derived by the bank from the difference between the price paid by the client for services (30,000 m.u.) and the operating cost of providing them (20,000 m.u.).

Finally, given the depositor believes the money he deposited in Bank A remains constantly available to him, a situation equal to or even better than his keeping the money in his own pocket or at home, he need not demand any additional compensation, as in the case of the loan contract, which is radically different. The loan contract required the lender to relinquish the availability of 1,000,000 m.u. of present goods (in other words, to *lend*) and to transfer the availability to the borrower in exchange for the corresponding interest and the repayment of the principal one year later.[6]

4
The Effects Produced by Bankers' Use of Demand Deposits: The Case of an Individual Bank

Nevertheless, as we saw in chapter 2, bankers were soon tempted to violate the traditional rule of conduct requiring

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[6]Mises, *The Theory of Money and Credit* offers this explanation:

> Therefore the claim obtained in exchange for the sum of money is equally valuable to him whether he converts it sooner or later, or even not at all; and because of this it is possible for him, without damaging his economic interests, to acquire such claims in return for the surrender of money *without demanding compensation for any difference in value arising from the difference in time between payment and repayment, such, of course, as does not in fact exist.* (p. 301; italics added)

them to maintain the *tantundem* of monetary irregular deposits continuously available to depositors, and they ended up using at least a portion of demand deposits for their own benefit. In chapter 3 we covered the comments of Saravia de la Calle with respect to this human temptation. Now we must stress how overwhelming and nearly irresistible it is, given the *huge profits that result from yielding to it*. When bankers first began using their depositors' money, they did so shamefacedly and in secret, as shown by chapter 2's analysis of different historical cases. At this time bankers were still keenly aware of the wrongful nature of their actions. It was only later, after many centuries and vicissitudes, that bankers were successful in their aim to openly and legally violate the traditional legal principle, since they happily obtained the governmental privilege necessary to use their depositors' money (generally by granting loans, which initially were often given to the government itself.)[7] We will now consider the way

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[7]Stephen Horwitz states that bankers' misappropriation of depositors' money began as "an act of true entrepreneurship as the imaginative powers of individual bankers recognized the gains to be made through financial intermediation." For reasons given in the main text, we find this assertion dangerously erroneous. Furthermore, as we will see, in the appropriation of demand deposits no financial intermediation takes place: only an awkward creation of new deposits from nothing. As for the supposedly "commendable" act of "entrepreneurial creativity," we do not see how it could possibly be distinguished from the "creative entrepreneurship" of any other criminal act, in which the criminal's powers of imagination lead him to the "entrepreneurial discovery" that he benefits from swindling others or forcibly taking their property. See Stephen Horwitz, *Monetary Evolution, Free Banking, and Economic Order* (Oxford and San Francisco: Westview Press, 1992), p. 117. See also Gerald P. O'Driscoll, "An Evolutionary Approach to Banking and Money," chap. 6 of *Hayek, Co-ordination and Evolution: His Legacy in Philosophy, Politics, Economics and the History of Ideas*, Jack Birner and Rudy van Zijp, eds. (London: Routledge, 1994), pp. 126–37. Perhaps Murray N. Rothbard has been the strongest, most articulate critic of Horwitz's idea. Rothbard states:

> [a]ll men are subject to the temptation to commit theft or fraud. . . . Short of this thievery, the warehouseman is subject to a more subtle form of the same temptation: to steal or "borrow" the valuables "temporarily" and to profit by speculation

bankers record the appropriation of demand deposits in their account books. Our study will begin with the case of an individual bank and will later extend to the banking system as a whole.

The Continental Accounting System

Two accounting systems, the continental and the Anglo-Saxon, have traditionally been used to document the phenomenon we are studying. The continental system is based on the false notion that for the depositor, the irregular deposit contract is a true deposit contract, while for the banker it is a loan or mutuum contract. In this case, Mr. X makes a "demand" deposit of 1,000,000 m.u. in Bank A, and Bank A receives the money not as a deposit, but as a loan it can freely use, considering the depositor will not be aware of this use nor be affected by it. Moreover, while keeping only a portion of deposits on hand as a *security reserve*, the bank estimates it will be able to comply with depositors' withdrawal requests. These expectations are especially strong, given that under normal circumstances it is highly unlikely customers will attempt to withdraw an amount exceeding the security margin or reserve ratio. Experience appears to show this is true, and the trust the bank has earned through years of properly safeguarding clients' deposits contributes to the unlikelihood of such a predicament, as does the fact that many withdrawals are offset by new deposits. If we suppose the banker considers a 10-percent security reserve (also called a "reserve ratio") sufficient to satisfy possible demands for deposit withdrawals, then the other 90 percent of demand deposits, or 900,000 m.u., would be available to him to use to his own benefit. Using the

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> or whatever, returning the valuables before they are redeemed so that no one will be the wiser. This form of theft is known as *embezzlement*, which the dictionary defines as "appropriating fraudulently to one's own use, as money or property entrusted to one's care." (Rothbard, *The Mystery of Banking*, p. 90)

For more on why the above activity should be legally classified as a criminal act of misappropriation, see chapter 1.

European accounting system, this economic event would be represented in the following way:[8]

When Mr. X makes the demand deposit, a book entry identical to number (7) is made, though this time it is not considered a memorandum entry.

Bank A

(10) Debit		Credit	
1,000,000	Cash	Demand deposit (made by Mr. X)	1,000,000

Once the bank yields to the temptation to appropriate most of the *tantundem*, which it should keep on hand and available to the depositor, the following entry is made:

Bank A

(11) Debit		Credit	
900,000	Loan to Z	Cash	900,000

At the moment the banker appropriates the money and loans it to Z, an economic event of great significance occurs: 900,000 m.u. are created *ex nihilo,* or out of nothing. Indeed, Mr. X's essential motive for making a demand deposit of 1,000,000 m.u. was the custody and safekeeping of the money, and with good reason he subjectively believes he retains the complete availability of it, just as if he had it in his pocket, and in a sense better. To all intents and purposes, Mr. X still has 1,000,000 m.u.

[8]The description of the different accounting systems (the English and the continental) and how they ultimately bring about identical economic results is found in F.A. Hayek, *Monetary Theory and the Trade Cycle* (Clifton, N.J.: Augustus M. Kelley, [1933] 1975), pp. 154ff.

in cash as if the money were physically "in his possession," since according to his contract it remains fully available to him. From an economic standpoint, there is no doubt the 1,000,000 m.u. Mr. X deposited in Bank A continue to contribute to his cash balances. However, when the bank appropriates 900,000 m.u. from deposits and loans them to Z, it simultaneously generates additional purchasing power from nothing and transfers it to Z, the borrower, who receives 900,000 m.u. It is clear that, both subjectively and objectively, Z enjoys the full availability of 900,000 m.u. beginning at that point and that these monetary units are transferred to him.[9] Therefore, *there has been an increase in the amount of money in circulation in the market, due to beliefs held simultaneously and with good reason by two different economic agents: one thinks he has 1,000,000 m.u. at his disposal, and the other believes he has 900,000 m.u. at his disposal. In other words, the bank's appropriation of 900,000 m.u. from a demand deposit results in an increase equal to 900,000 m.u. in the aggregate balances of money existing in the market. In contrast, the loan or mutuum contract covered earlier involves no such occurrence.*

We should also consider the location of the existing money in the market from the time the banker appropriates the deposit. The number of monetary units in the market has clearly grown to 1,900,000, though these units exist in different forms. We say there are 1,900,000 m.u. because different economic agents subjectively believe they have at their disposal 1,900,000 m.u. to exchange in the market, and money consists of all generally-accepted mediums of exchange.

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[9]Money is the only perfectly liquid asset. The bank's failure to comply with a 100-percent reserve ratio on demand deposits brings about a serious economic situation in which two people (the original depositor and the borrower) simultaneously believe they are free to use the same perfectly liquid sum of 900,000 m.u. It is logically impossible for two people to simultaneously own (or have fully available to them) the same perfectly liquid good (money). This is the fundamental economic argument behind the legal impracticability of the monetary irregular-deposit contract with fractional reserves. It also explains that when this "legal aberration" (in the words of Clemente de Diego) is imposed by the state (in the form of a privilege—*ius privilegium*—given to the bank), it entails the creation of new money (900,000 m.u.).

Nevertheless the form of the money varies: Borrower Z possesses it in a different form from Mr. X, who made the deposit. Indeed, Z has available to him 900,000 *physical* monetary units (which we could call *commodity money* or, nowadays, *paper money* or *fiat money*), while Depositor X has a checking account containing a deposit of 1,000,000 m.u. Considering the bank has kept 100,000 m.u. in its vault as a security reserve or reserve ratio, the difference between 1,900,000 m.u. and the 1,000,000 m.u. existing in physical form is equal to the amount of money the bank created from nothing. (A total money supply of 1,900,000 m.u. minus 900,000 physical m.u. in Z's possession and 100,000 physical m.u. in the bank's vault equals 900,000 m.u. which do not physically exist anywhere.) As this money lacks the corresponding backing and exists due to the confidence Depositor X has in Bank A, it is called *fiduciary money* (or, better, *fiduciary media*). It is important to emphasize that to all intents and purposes demand deposits are like *physical* units; that is, they are perfect *money substitutes*. The depositor can use them to make payments at any time by issuing a check on which he writes the sum he wishes to pay and giving instructions to the bank to make the payment. The portion of these perfect money substitutes, or demand deposits, which is not fully backed by physical monetary units in the bank's vault (the 900,000 m.u. not backed by reserves in the present example) is called *fiduciary media*.[10]

Demand deposits backed by cash reserves at the bank (100,000 m.u. in our example) are also called *primary deposits*, while the portion of demand deposits not backed by the

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[10]"If the money reserve kept by the debtor against the money-substitute sissued is less than the total amount of such substitutes, we call that amount of substitutes which exceeds the reserve *fiduciary media*." Mises, *Human Action,* p. 430. Mises clarifies that it is not generally possible to declare whether a particular money substitute is or is not a fiduciary medium. When we write a check, we do not know (because the bank does not directly inform us) what portion of the check's sum is backed by physical monetary units. As a result, from an economic standpoint, we do not know what portion of the money we are paying is a fiduciary medium and what portion corresponds to physical monetary units.

bank's reserves (fiduciary media) is also called a *secondary deposit or derivative deposit*.[11]

Once banks had violated the legal principle that no one may appropriate a deposit made with them for safekeeping, and had ceased to guard 100 percent of the *tantundem*, it was natural for them to try to justify their activity and defend themselves with the argument that they had actually received the money *as if* it were a loan. In fact, if a banker considers the money received a loan, then there is nothing improper in his conduct, and from the economic and accounting viewpoint described in the previous section, he is only playing the legitimate, necessary role of intermediary between lenders and borrowers. Nonetheless, an essential difference arises here: the money is not handed over to the bank as a loan, but as a deposit. In other words, when Mr. X made his deposit, he did not have the slightest intention of relinquishing the availability of present goods in exchange for a somewhat higher figure (considering interest) of future goods. Instead, his only desire was to improve the custody and safekeeping of his money and to receive other peripheral services (cashier and bookkeeping services), while at all times retaining the full, unaltered availability of the *tantundem*. This absence of an exchange of present goods for future goods is precisely what

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[11]This terminology has become the most widespread, as a result of Chester Arthur Phillips' now classic work. Phillips states:

> a primary deposit is one growing out of a lodgement of cash or its equivalent and not out of credit extended by the bank in question . . . derivative deposits have their origins in loans extended to depositors . . . they arise directly from a loan, or are accumulated by a borrower in anticipation of the repayment of a loan. (*Bank Credit: A Study of the Principles and Factors Underlying Advances Made by Banks to Borrowers* (New York: Macmillan, [1920] 1931, pp. 34 and 40)

Nonetheless, we have a small objection to Phillips's definition of "derivative deposits" as deposits originating from loans. Though loans are their most common source, derivative deposits are created the very moment the bank uses, either for granting loans or any other purpose, a portion of the deposits received, converting them *ipso facto* into fiduciary media or derivative deposits. On this topic, see Richard H. Timberlake, "A Reassessment of C.A. Phillips's Theory of Bank Credit," *History of Political Economy* 20 no. 2 (1988): 299–308.

indicates we are faced with a radically different economic event, one that involves the creation *ex nihilo* of 900,000 m.u. of fiduciary media or derivative deposits when the bank loans 90 percent of the money it has in its vault.

In addition it is important to understand clearly that if the bank uses the money to grant a loan to Z, as we have supposed in our example and is usually the case, this loan does entail the exchange of present goods for future goods, *though it is not backed anywhere in the market by a necessary, previous increase of 900,000 m.u. in voluntary saving*. Indeed, the bank creates from nothing money it loans to Z in the form of present goods, while no one has been first obliged to increase his savings by the amount of the loan. Mr. X, the original depositor, continues to subjectively believe he possesses the full availability of the 1,000,000 m.u. he deposited in the bank; that is, he thinks he has at his disposal 1,000,000 m.u. of a completely liquid asset (money). At the same time, Borrower Z receives for his investments 900,000 m.u. of new liquidity which has not come from anyone's savings. In short, two different people simultaneously believe they have at their full disposal the same liquid asset of 900,000 m.u., which correspond to the portion of the deposit of 1,000,000 m.u. which the bank loaned to Z (derivative deposit). At this point it is obvious banks generate liquidity which is invested without any prior saving. This phenomenon constitutes the main cause of recurring economic crises and recessions, and we will examine its crucial economic importance in the following chapters.

Once the bank has given the loan to Z, the bank's balance sheet appears as follows:

(12)

Bank A
Balance Sheet
(End of the year)

Assets		Liabilities	
Cash	100,000	Demand deposit	1,000,000
Loans granted	900,000		
Total Assets	1,000,000	Total Liabilities	1,000,000

Clearly, the banker will tend to deceive himself, thinking he has received his depositors' money as a loan. Furthermore, it will never occur to him that by granting the loan to Business Z he has created 900,000 m.u. *ex nihilo*, nor much less that he has granted a loan without the prior backing of an actual increase in saving by anyone. Moreover, the banker will consider the natural counteraction between withdrawals and new deposits, and in accordance with his "experience," he will deem his decision to maintain a cash or security reserve of 10 percent adequate and the resulting cash reserve of 100,000 m.u. more than sufficient to satisfy requests for *normal* deposit withdrawals by customers.[12] The whole structure is made possible by customers' faith that the bank will honor its future commitments. The bank must build up this faith through the impeccable custody and safekeeping of the money for an extended period of time, without any misappropriation.[13] It is understandable that a banker may not be familiar with economic theory and therefore not recognize the fundamental economic events we have just described. It is more difficult to excuse the fact that his misappropriation of deposits constitutes a violation of traditional legal principles which, in the absence of a theory to explain the social processes involved, serve as the only safe guide to follow in order to avoid severe social damage. However, any intelligent person, banker or not, would surely be able to see some *signs* of what is really happening. Why is it necessary for the banker to maintain *any* reserve ratio? Does he not realize that when he acts legitimately as true intermediary between lenders and borrowers he need not maintain any? Does he not understand, as Röpke states, that his bank is "an institution which, finding it possible to hold less cash than it promises to pay and living on the difference,

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[12]Nevertheless we will demonstrate that the fractional-reserve banking system itself regularly generates abnormal (massive) withdrawals of deposits and cannot with a fractional-reserve ratio fulfill at all times depositors' demands for these withdrawals.

[13]We are, of course, referring to the different historical stages in which fractional-reserve banking emerged (prior to the existence of central banks); we covered these in chapter 2.

regularly promises more than it could actually pay should the worse come to the worst"?[14] In any case, these are simply indications which any practical person could understandably interpret in a wide variety of ways. Legal principles exist for precisely this reason. They act as an "automatic pilot" for behavior and facilitate cooperation between people, though given the abstract nature of these principles, we may not be able to identify their exact role in the processes of social interaction.

As Mises correctly indicates, as long as confidence in the bank is preserved, the bank will be able to continue using the majority of deposited funds, and customers will remain unaware that the bank lacks the necessary liquidity to meet all of its commitments. It is as if the bank had found a permanent source of financing in the creation of new money, a source it will continue to tap as long as the public retains its faith in the bank's ability to fulfill its commitments. In fact, as long as these circumstances last, the bank will even be able to use its newly created liquidity for covering its own expenses or for any other purpose besides granting loans. In short, the ability to create money *ex nihilo* generates wealth the banker can easily appropriate, provided customers do not doubt his good conduct. The generation of this wealth is detrimental to many third parties, each of whom suffers a share of the damage caused by the banker's activities. It is impossible to identify these individuals, and they are unlikely to recognize the harm they suffer or to discover the identity of the perpetrator.[15]

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[14]Wilhelm Röpke, *Economics of the Free Society*, trans. Patrick M. Boarman (Grove City, Pa.: Libertarian Press, 1994), p. 97.

[15]We will examine the process of loan creation and the resulting transfer of wealth to bankers in our analysis of the effects fractional-reserve banking has from the perspective of the entire banking system. Regarding the fact that it is not necessary for fiduciary media to be lent (though in practice this is always or almost always the case), Ludwig von Mises states:

> [i]t is known that some deposit banks sometimes open deposit accounts without a money cover not only for the purpose of granting loans, but also for the purpose of directly procuring resources for production on their own behalf. More than one of the modern credit and commercial banks has

Though private bankers may often be unaware that their ability to create new money *ex nihilo* (by using customers' deposits to grant loans) constitutes a source of huge profits, and although they may naively believe they are merely loaning a part of what they receive, the majority of their profits still derive from a general process in which they are immersed and the implications of which they do not completely comprehend. We will see this point confirmed later when we study the effects of fractional-reserve banking in terms of the entire *banking system*. One thing bankers understand perfectly, however, is that by loaning most of the funds clients deposit, they make a *much larger* profit than they would if they acted only as legitimate intermediaries between lenders and borrowers—entries (1) to (6)—or as mere providers of bookkeeping and cashier services—entries (8) and (9). In fact on the loan made to Z, Bank A will earn an interest rate of 15 percent of the amount of the loan; that is, 135,000 m.u. The entry is as follows:

Bank A

(13) Debit	Credit
135,000 Cash	Revenue from interest on loans 135,000

> invested a part of its capital in this manner . . . the issuer of fiduciary media may, however, regard the value of the fiduciary media put into circulation *as an addition to his income or capital*. If he does this he will not take the trouble to cover the increase in his obligations due to the issue by setting aside a special credit fund out of his capital. He will pocket the profits of the issue, which in the case of token coinage is called seigniorage, as composedly as any other sort of income. (Mises, *The Theory of Money and Credit*, p. 312; italics added)

In light of these considerations, it is not surprising that of all economic institutions, banks generally display to the public the most spectacular, luxurious buildings and spend the most disproportionate amount on offices, payroll, etc. It is no less surprising that governments have been the first to take advantage of banks' great power to create money.

If we suppose the bank performs the cashier and bookkeeping services described earlier, which are typical of checking accounts and generate an operating cost of 20,000 m.u. in our example, then by covering these costs with interest income it is even able to provide these services free of charge. The following entry is made to record the operating costs:

Bank A

(14) Debit		Credit	
20,000 Operating costs of services		Cash	20,000

Although the bank would be completely justified in continuing to charge 30,000 m.u. (3 percent of the amount deposited) for its services, and although it may offer these services free to its depositors to attract more deposits and to pursue the more or less covert objective of using these deposits to grant loans, it still makes a very large profit, equal to the 135,000 m.u. it receives in interest, minus the 20,000 m.u. it pays in operating costs.

In fact the bank's profit of 115,000 m.u. is more than *double* the legitimate profit it would make as a mere financial intermediary between lenders and borrowers and more than ten times what it would bring in by charging its customers for cashier and bookkeeping services.[16] The bank's income statement would hence appear as follows:

(15)

Bank A
Income Statement
(During the year)

Expenses		Revenues	
Operating costs	20,000	Interest received	135,000
Net Income	115,000		
Total Debit	135,000	Total Credit	135,000

[16]See footnote number 25.

After carrying out all of the operations, the bank's balance sheet would appear as follows:

(16) Bank A

Balance Sheet
(End of the year)

Assets		Liabilities	
Cash	215,000	Owner's Equity (Profit for the year)	115,000
Loans granted	900,000	Demand deposits	1,000,000
Total Assets	1,115,000	Total Liabilities	1,115,000

ACCOUNTING PRACTICES IN THE ENGLISH-SPEAKING WORLD

English banking practices reflect fewer reservations about plainly recording in the accounts the creation *ex nihilo* of fiduciary media. Indeed, as Hayek states, "English banking practice credits the account of the customer with the amount borrowed before the latter is actually utilized."[17]

In English-speaking countries, when a customer makes a demand deposit of 1,000,000 m.u. at a bank, the first account entry made corresponds exactly to that made in the continental system:

Bank A

(17) Debit		Credit	
1,000,000	Cash	Demand deposits	1,000,000

[17]Hayek, *Monetary Theory and the Trade Cycle*, p. 154. Hayek goes on to say: "Granted this assumption, the process leading to an increase of circulating media is comparatively easy to survey and therefore hardly ever disputed."

The difference between the Anglo-Saxon and the continental system lies in the entry the English-speaking banker makes upon deciding to grant a loan to Z, and hence to make self-interested use of 900,000 m.u. the banker holds in his vault in excess of his security reserve. In Anglo-Saxon banking practices, an entry is made to record the loan under Assets, and at the same time a checking account in favor of the borrower is opened under Liabilities for the sum of the loan (900,000 m.u.). The entry looks like this:

Bank A

(18)	Debit		Credit	
900,000	Loans granted		Demand deposits	900,000

Thus, in this respect the English custom is much more straightforward and appropriate to the actual economic events than the continental custom. Anglo-Saxon accounting practices distinctly reflect the *ex nihilo* creation of 900,000 m.u. which results when demand deposit funds are loaned to Z. After the loan is granted, the bank's balance sheet appears as follows:

Bank A
Balance Sheet

(19)	Assets		Liabilities	
Cash		1,000,000	Demand deposits	1,900,000
Loans		900,000		
Total Assets		1,900,000	Total Liabilities	1,900,000

In keeping with the English custom, this balance sheet clearly reveals that the moment the bank grants a loan of

900,000 m.u., it simultaneously generates deposits *ex nihilo* for the sum of 900,000 m.u. In other words, the bank places at the disposal of the borrower up to 900,000 m.u., which raises the balance of demand deposits to 1,900,000 m.u. Of this amount, 1,000,000 m.u. correspond to physical monetary units; that is, to primary deposits. The other 900,000 m.u. reflect fiduciary media created from nothing; in other words, derivative or secondary deposits.

If we again suppose for the sake of argument that the banker regards as a *loan* the money placed with him on demand deposit, then because this loan derives from a monetary irregular-deposit contract, which by definition stipulates no term for the return of the money (as it is "on demand"), the "loan" in question would clearly have no term. Furthermore, if the depositors trust the bank, the banker will rightly expect them to withdraw only a small fraction of their deposits under normal conditions. As a result, even though the "loan" he has supposedly received from his depositors is "on demand," the banker may with good reason consider it a "loan" *he will never have to return*, since it ultimately lacks a term. Obviously if the banker receives a loan believing he will never have to return it (and in most cases he does not even have to pay interest on it, though this is not fundamental to our argument), then rather than a loan, we are dealing with a *de facto gift* the banker gives himself and charges to the funds of his depositors. This means that although for accounting purposes the bank recognizes a debt (parallel to the loan granted) in the form of "demand deposits" (derivative or secondary deposits for the sum of 900,000 m.u.), under ordinary circumstances what the bank actually does is to create from nothing a perennial source of financing which the banker supposes *he will never have to return*. Therefore, despite the impression the account books give, the banker ultimately appropriates these funds and considers them his property. In short, banks amass tremendous wealth, mainly by generating means of payment to the detriment of third parties. The harm done is very generalized and diluted, however, and takes the form of a gradual relative loss of purchasing power. This phenomenon occurs constantly and stems from the banking system's *ex nihilo* creation of means of payment. This continuous transfer

of wealth to bankers persists as long as the banking business suffers no disruptions and assets keep increasing bankers' balances in the form of loans and investments backed by the corresponding deposits created from nothing. The full recognition of this never-ending source of financing and of the enormous wealth banks have accumulated to the detriment of other citizens (money which still contributes to the banks' balances, disguised as active investments backed by "deposits") will prove very important in the last chapter, when we propose a model for changing and reforming the current banking system. Though these funds in fact only benefit banks and governments, and though from an economic and accounting standpoint they belong to alleged depositors, in all reality *they do not belong to anyone*, since these depositors view their deposits as perfect money substitutes. Therefore, as we will see when we study the process of banking reform, these resources could be used to pursue important goals in the public interest. Such goals might include eliminating the remaining public debt or even financing a process of social-security reform to accomplish a transition from a pay-as-you-go public system to an entirely private system based on investment.

Let us return now to our example. As Borrower Z gradually uses his money by writing checks on the account opened for him by the bank, the two banking systems, the Anglo-Saxon and the Continental, would begin to reflect the bank's account records in an increasingly similar way. Let us suppose the borrower withdraws his loan in two portions, one on each of two separate, consecutive occasions. On the first occasion (t1) he withdraws 500,000 m.u., and on the second (t2), 400,000 m.u. The accounting entries would appear as follows:

Bank A (t_1)

(20)	Debit		Credit	
500,000	Demand deposits (part of the loan withdrawn by Z)		Cash	500,000

Bank A (t_2)

(21)	Debit		Credit	
400,000	Demand deposits (the remainder of the loan)		Cash	400,000

After the borrower withdraws the entire loan, the bank's balance sheet looks like this:

(22) Bank A
Balance Sheet

Assets		Liabilities	
Cash	100,000	Demand deposits	1,000,000
Loans	900,000		
Total Assets	1,000,000	Total Liabilities	1,000,000

This balance sheet corresponds exactly with balance sheet (12), which we obtained using continental accounting methods and which comprises demand deposits of 1,000,000 m.u. made by customers and backed by 100,000 m.u. in cash (the reserve ratio or requirement) and 900,000 m.u. in loans granted to Z. Therefore once the borrower withdraws his entire loan, the accounting records of both systems are identical: 1,900,000 m.u. exist in the market, of which 900,000 m.u. correspond to fiduciary media (the portion of demand deposits which are not backed by cash balances at the bank, in this case 1,000,000 m.u. minus 100,000 m.u.) and 1,000,000 m.u. are physical monetary units (the 100,000 m.u. in the bank's vault and the 900,000 m.u. that have been handed over to Borrower Z and which he has already used for his own purposes).[18]

[18]The banking practices of the English-speaking world have been adopted in Spain as well, as evidenced, among other sources, by Pedro

The main advantage of the Anglo-Saxon accounting system is that it demonstrates, as Herbert J. Davenport pointed out in 1913, that banks "do not lend their deposits, but rather, by their own extensions of credit, *create* the deposits."[19] In other words, banks *do not act as financial intermediaries* when they loan money from demand deposits, since this activity does not constitute mediation between lenders and borrowers.

Pedraja García's book, *Contabilidad y análisis de balances de la banca,* vol. 1: *Principios generales y contabilización de operaciones* (Madrid: Centro de Formación del Banco de España, 1992), esp. pp. 116–209.

[19]Herbert J. Davenport, *The Economics of Enterprise* (New York: Augustus M. Kelley, [1913] 1968), p. 263. Fourteen years later, W.F. Crick expressed the same idea in his article, "The Genesis of Bank Deposits," *Economica* (June 1927): 191–202. Most of the public and even some scholars as distinguished as Joaquín Garrigues fail to understand that banks are mainly creators of loans and deposits, rather than mediators between lenders and borrowers. In his book *Contratos bancarios* (pp. 31–32 and 355), Garrigues continues to insist that banks are primarily credit mediators that "loan money which has been lent to them" (p. 355) and also that bankers

> loan what they are lent. They are credit mediators, businessmen who mediate between those who need money for business deals and those who wish to invest their money profitably. Banks, however, may engage in two different types of activities: they may act as mere mediators who bring together contracting parties (direct credit mediation) or they may carry out a double operation consisting of borrowing money in order to later lend it (indirect credit mediation). (p. 32)

Garrigues clearly does not realize that, with respect to banks' most important enterprise (accepting deposits while maintaining a fractional reserve), banks actually grant loans from nothing and back them with deposits they also create from nothing. Therefore, rather than credit mediators, they are *ex nihilo* creators of credit. Garrigues also subscribes to the popular misconception that "from an economic standpoint," the bank's profit consists of "the difference between the amount of interest it pays on the deposit operation and the amount it earns on the loan operation" (p. 31). Though banks appear to derive their profit mainly from an interest rate differential, we know that in practice the chief source of their profit is the *ex nihilo* creation of money, which provides banks with financing indefinitely. Banks appropriate these funds for their own benefit and charge interest on them to boot. In short, bankers create money from nothing, loan it and require that it be returned with interest.

Instead banks simply grant loans against deposits they create from nothing (*fiduciary media*) and which therefore have not first been entrusted to them by any third party as deposits of physical monetary units. Not even under the continental accounting system are banks financial intermediaries, since true original depositors turn their money over for custody and safekeeping, not as a loan to the bank. Furthermore we have already shown that by reducing to a fraction the number of monetary units they keep on hand (reserve ratio), banks create fiduciary media in proportion to the total sum of their unbacked deposits. Thus, by a somewhat more abstract analysis, the continental accounting system leads us to the same conclusion as the Anglo-Saxon system: rather than credit intermediaries, banks are creators of loans and deposits, or fiduciary media. Nevertheless, the process is much more obvious and easier to understand when evaluated according to Anglo-Saxon accounting criteria, because from the beginning this method reflects the fact that the bank creates deposits *ex nihilo* and grants loans against them. Therefore, no abstract intellectual exercise is required to understand the process.

From the perspective of economic theory, the chief disadvantage of both accounting systems is that they reflect a *much lower* volume of deposit creation and loan concession than truly exists. That is, they reveal only a fraction of the total volume of deposits and loans which the banking system *as a whole* is capable of creating. Only when we consider the effects of fractional-reserve banking from the standpoint of *the overall banking system* will this important fact be confirmed. However, first it is necessary to identify the limits to deposit creation and loan concession by an isolated bank.

An Isolated Bank's Capacity for Credit Expansion and Deposit Creation

We will now consider the limits to an isolated bank's capacity to create loans and expand deposits from nothing. The following variables are involved:

d: the money originally deposited in the bank's vault;

d_1: the money or reserves which leave the bank as a result of loans it grants;

x: the bank's maximum possible credit expansion starting from d;

c: the cash or reserves ratio maintained by the bank, in keeping with the banker's experience and his careful judgment on how much money he needs to honor his commitments; and

k: the proportion of loans granted which, on average, remain unused by borrowers at any given time.

From the above definitions it is clear that the reserves which leave the bank, d_1, will be equal to the loans granted multiplied by the percentage of these loans which is used by borrowers; that is:

[1] $$d_1 = (1 - k)x$$

In addition, if we consider that the money which leaves the bank, d_1, is equal to the amount originally deposited, d, minus the minimum amount kept on reserve, cd, in relation to the money originally deposited, plus ckx, in relation to the percentage of loans which on average remains unused, then we have:

[2] $$d_1 = d - (cd + ckx)$$

If we now replace d_1 in formula [2] with the value of d_1 in [1], we have:

$$(1 - k)x = d - (cd + ckx)$$

Next we work to solve the equation, factor out common factors and isolate x:

$$(1 - k)x = d - cd - ckx$$

$$(1 - k)x + ckx = d - cd$$

$$x(1 - k + ck) = d(1 - c)$$

Therefore the maximum credit expansion, x, an isolated bank could bring about *ex nihilo* would be:[20]

$$x = \frac{d\ (1 - c)}{1 - k(1 - c)}$$

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[20]Significantly, however, Ludwig von Mises, in his important theoretical treatises on money, credit and economic cycles, has always resisted basing his analysis on the study of the credit expansion multiplier we have just worked out in the text. These writings of Mises all focus on the disruptive effects of creating loans unbacked by an increase in actual saving, and the fractional-reserve banking system which carries out such loan creation by generating deposits or fiduciary media. Mises's resistance to the multiplier is perfectly understandable, considering the aversion the great Austrian economist felt to the use of mathematics in economics and more specifically to the application of concepts which, like the bank multiplier, may be justly labeled "mechanistic," often inexact and even deceptive, mainly because they do not take into account the process of entrepreneurial creativity and the evolution of subjective time. Furthermore, from the strict viewpoint of economic theory, it is unnecessary to work out the multiplier mathematically to grasp the basic concept of credit and deposit expansion and how this process inexorably provokes economic crises and recessions. (Ludwig von Mises's chief theoretical goal was to arrive at such an understanding.) Nevertheless the bank multiplier offers the advantage of simplifying and clarifying the explanation of the continual process of credit and deposit expansion. Therefore, for the purpose of illustration, the multiplier reinforces our theoretical argument. The first to employ the bank multiplier in a theoretical analysis of economic crises was Herbert J. Davenport in his book, *The Economics of Enterprise*, (esp. chap. 17, pp. 254–331) a work we have already cited. Nonetheless F.A. Hayek deserves recognition for incorporating the theory of the bank credit expansion multiplier to the Austrian theory of economic cycles (*Monetary Theory and the Trade Cycle*, pp. 152ff). See also note 28, in which Marshall, in 1887, provides a detailed description of how to arrive at the most simplified version of the bank multiplier formula.

Or to put it another way:

$$[3] \qquad x = \frac{d\ (1 - c)}{1 + k(c - 1)}$$

As formula [3] makes clear, the reserve ratio, c, and the average percentage of loans which remain unused, k, have opposite effects on an isolated bank's capacity to create loans and deposits. That is, the lower c is and the higher k is, the higher x will be. The economic logic of formula [3] is therefore very plain: the higher the reserve ratio estimated necessary by the bank, the fewer the loans it will be able to grant; in contrast, if the reserve ratio or requirement remains unchanged, the fewer the loaned funds the bank believes, on average, will be withdrawn by borrowers, the more money it will have available for expanding loans.

Up until now we have assumed k to be the average percentage of loans unused by borrowers. However, according to C.A. Phillips, k can include other phenomena which have the same ultimate effect.[21] For instance, k can stand for the very great likelihood that, in a market where few banks operate, a borrower will make payments to some other customers of his own bank. It is assumed that when this happens, these customers will deposit their checks in their own accounts at the same bank, thus keeping money from leaving the bank. This phenomenon has the same ultimate effect as an increase in the average percentage of loans unused by borrowers. The fewer the banks operating in the market, the higher k will be; the higher k is, the less money will leave the bank; the less money leaves the bank, the greater the bank's capacity for expanding loans. One of the strongest motivations behind the trend toward bank mergers and acquisitions which has always been obvious in fractional-reserve banking systems is precisely the desire to increase k.[22] In fact, the more banks merge and the

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[21]Phillips, *Bank Credit*, pp. 57–59.

[22]Other forces exist to explain the process of bank mergers. They all stem from banks' attempt to minimize the undesirable consequences

larger their subsequent market share, the greater the possibility that the citizens who receive the banks' fiduciary media will be their own customers. Therefore both *k* and the corresponding capacity to create loans and deposits from nothing will be increased and the resulting profit much greater. The value of *k* is also increased when monetary deposits are made in other banks, which in turn expand their loans, and their borrowers ultimately deposit in the original bank a significant portion of the new money they receive. This phenomenon also causes an increase in the bank's monetary reserves and therefore in its capacity for credit expansion.

For example, if we suppose that the reserve ratio or requirement, *c*, is 10 percent; that the proportion of loans which remain unused, *k* (which also includes the effects of a larger number of bank customers, as well as other factors), is

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they suffer as a result of their violation, via the corresponding state privilege, of the essential principles behind the monetary irregular-deposit contract. One advantage banks gain from mergers and acquisitions is the ability to establish centralized cash reserves, which are kept available for fulfilling withdrawal requests at any location where a higher than average number of them may be made. In a market where many banks operate, this benefit is lost, since each bank is then obliged to maintain separate, relatively higher cash reserves. Public authorities also urge rapid mergers, because they hope it will make it easier for them to prevent liquidity crises, implement monetary policy and regulate the banking industry. We will later analyze bankers' persistent desire to increase the volume of their deposits, since as the formula shows, the sum of deposits forms the basis for the multiple expansion of loans and deposits, which banks create *ex nihilo* and from which they derive so many benefits. On bank mergers, see C. Bresciani-Turroni, *Curso de economía política*, vol. 2: *Problemas de economía política* (Mexico: Fondo de Cultura Económica, 1961), pp. 144–45. In any case, it is important to recognize that the irresistible bank-merger process results from state interventionism in the field of finance and banking, as well as from the privilege that allows banks to operate with fractional reserves on demand deposits, against traditional legal principles. In a free-market economy with no government intervention, where economic agents are subject to legal principles, this continual trend toward bank mergers would disappear, banks' size would be practically immaterial and there would be a tendency toward a very high number of entirely solvent banks.

20 percent; and that the sum of the original deposits, *d*, made in the bank is equal to 1,000,000 m.u.; then, by substituting these values into formula [3] we obtain:

$$[4] \qquad x = \frac{1{,}000{,}000\ (1 - 0.1)}{1 + 0.2\ (0.1 - 1)} = 1{,}097{,}560 \text{ m.u.}$$

Therefore we see that a bank which accepts 1,000,000 m.u. in demand deposits, and which maintains a reserve ratio of 10 percent and a *k* of 20 percent will be able to grant loans not only for the sum of 900,000 m.u., as we assumed for the purpose of illustration in entries (18) and following, but for a considerably larger amount, 1,097,560 m.u. Hence, even in the case of an isolated bank, the capacity for credit expansion and *ex nihilo* deposit creation is 22 percent greater than we initially supposed in entries (18) and following.[23] As a result, we should modify our earlier accounting entries to reflect that, in keeping with the Anglo-Saxon accounting system, when *c*=0.1 and *k*=0.2, the bank will be able to expand its credit by 1,097,560 m.u., instead of the 900,000 we assumed before (that is, the bank's capacity for credit expansion is 22 percent greater). The modified journal entries and corresponding balance sheet would appear as follows (compare with initial entries 18 and 19):

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[23]Even though, from the standpoint of an isolated bank, it appears as if the bank were loaning a portion of its deposits, the reality is that even an isolated bank creates loans *ex nihilo* for a sum larger than that originally deposited. This demonstrates that the principal source of deposits is not depositors, but rather loans banks create from nothing. (Deposits are a secondary result of these loans.) This will be even clearer when we study the overall banking system. C.A. Phillips expresses this fact by stating, "It follows that for the banking system, deposits are chiefly the offspring of loans." See Phillips, *Bank Credit*, p. 64, and the quotation from Taussig in note 62, chapter 5.

Bank A

(23) Debit		Credit	
1,000,000	Cash	Demand deposits (checking accounts)	1,000,000
1,097,560	Loans granted	Demand deposits (newly-created deposits)	1,097,560

These entries correspond to an original deposit of 1,000,000 m.u. and an isolated bank's *ex nihilo* creation of loans and deposits for the sum of 1,097,560 m.u. The value of k (0.2) indicates that, on average, borrowers only withdraw 80 percent of the funds they are lent. When this withdrawal is made (and even if a greater amount is withdrawn, when some of the final recipients of the money are also customers of the original bank and deposit their money there), the following entry is recorded:[24]

[24]Former continental accounting methods are more complex. However, it is possible to arrive at balance sheet (25) by supposing that the statement k=0.2, instead of referring to the percentage of loan funds unused (which, as we know, this system does not reflect), represents the proportion of the public which does business regularly with the bank and therefore will deposit funds back into it. In this case, the entries would appear as follows:

Bank A

(26) Debit		Credit	
1,000,000	Cash	Demand deposits	1,000,000

Upon loaning 900,000 m.u., the bank would make the following entry:

Bank A

Debit		Credit	
900,000	Loans	Cash	900,000

Bank A

(24)	Debit	Credit	
878,048	Demand deposits (80% of 1,097,560)	Cash	878,048

The bank's balance sheet would appear as follows:

If we suppose that 20 percent of the 900,000 m.u. which leave the bank's vault will again be deposited in the same bank, and that 90 percent of that amount will then be loaned, etc., the entries appear as follows:

(27)	Debit	Credit	
180,000	Cash	Demand deposits	180,000

When 90 percent of this amount is loaned:

Bank A

(28)	Debit	Credit	
162,000	Loans	Cash	162,000
32,400	Cash	Demand deposits	32,400
29,160	Loans	Cash	29,160
5,832	Cash	Demand deposits	5,832
5,248	Loans	Cash	5,248

We have supposed that 20 percent of each loan granted has returned to the bank's vault, given that the final recipients of that proportion of funds loaned are customers of the bank.

Therefore, a balance sheet drawn up according to the continental system would look like this:

(25)

Bank A
Balance Sheet
c=0.1 and *k=0.2*

Assets		Liabilities	
Cash	121,952	Demand deposits	1,219,512
Loans	1,097,560		
Total Assets	1,219,512	Total Liabilities	1,219,512

THE CASE OF A VERY SMALL BANK

Let us now consider a particular type of isolated bank: a very small or "Lilliputian" bank; that is, one in which *k*=0.

(29)

Bank A
Balance Sheet
(By the continental system)
c=0.1 k=0.2

Assets		Liabilities	
Cash	121,824	Demand deposits	1,218,232
Loans	1,096,408		
Total Assets	1,218,232	Total Liabilities	1,218,232

These figures are practically identical to those in balance sheet (25). They do not match exactly because our example stops at the third repetition of the loan-deposit process. If we had continued to follow the process, the numbers in balance sheet (29) would have become more and more similar to those in (25), and they eventually would have matched exactly.

This means borrowers immediately withdraw the entire amount of their loans, and those to whom they make payments are not customers of the same bank as the borrowers. If k=0, then by substituting this value into formula [3] we obtain formula [5]:

$$[5] \qquad x = d(1 - c)$$

And since in our example d = 1,000,000 m.u. and c = 0.1, then:

$x = 1{,}000{,}000(1 - 0.1) = 1{,}000{,}000 \cdot 0.9 = 900{,}000$ *m.u.*

This is precisely the sum of deposits or fiduciary media created *ex nihilo* which appears in entries (11) and (18). Nevertheless, we saw in the last section that in practice, even if k is only slightly larger than 0, an isolated bank can create a considerably larger amount of fiduciary media. (If k=0.2, it can create 22 percent more, or 1,097,560 m.u. instead of the 900,000 m.u. in the first example.) This is true whether the bank uses the continental accounting system or the Anglo-Saxon system, and the sum created may even exceed the total of original deposits in the isolated bank.

With this in mind, it is easy to understand why banks compete as fiercely as they do to attract the largest possible number of deposits and customers. Bankers try to obtain as much money as possible in the form of deposits, because they are capable of expanding credit for an even greater amount than the volume of their deposits. Thus, the greater the volume, the more the bank will be able to expand the corresponding credit. Bankers try to attract as many customers as they can, because the more customers they have, the larger k will be; and the larger k is, the greater their capacity to expand loans and generate deposits. Most importantly, bankers are technically unable to discern whether their growth policies lead to a broadening of their individual spheres of activity at the expense of other banks, or whether their policies ultimately result in a generalized increase in credit expansion involving the entire banking system, or whether both occur at once.

Banks expand credit and deposits on their own and also participate in processes which bring about even greater credit and deposit expansion in the banking system as a whole. Moreover, in this process banks strive to play an increasingly important role with respect to other banks, and as a result they continually provide fresh impetus to credit expansion on the level of individual banks and in the banking system as a whole. In any case, k is a crucial factor in determining a bank's earning power. Competition between banks keeps k significantly below 1, however each bank fights to continually raise the value of its k factor. To do so banks take advantage of their opportunities (with respect to geographic expansion, the ability to exclude or take over competitors and the development of competitive advantages).[25] Though a k factor equal to one is impossible for an isolated bank (except in the case of a monopolistic bank), k values significantly greater than zero are very common, and under almost all circumstances, banks make a supreme effort to increase k. Among other phenomena, this explains the constant pressure they face to merge with other banks.

For illustrative purposes, we have compiled the following table of different combinations of reserve ratios, c, and percentages of loans unused or customers banking with the same institution, k, which allow an isolated bank to alone double its money supply (by substituting these values into formula [3], we obtain $x=d$).

Reserve ratio "c"	Percentage of loans unused "k"
	$k = \dfrac{c}{1-c} \quad (x = d = 1)$

[25]In some cases banks even pay interest to their checking-account holders in order to attract and keep new deposits. As a result, they ultimately reduce the large profit margins reflected in entry (15). This does not affect our essential argument nor banks' capacity to create deposits, their main source of profit. In the words of Mises, in this competitive process "some banks have gone too far and endangered their solvency." Mises, *Human Action*, p. 464.

2 percent	2.04 percent
5 percent	5.26 percent
7 percent	7.52 percent
13 percent	14.94 percent
15 percent	17.64 percent
17 percent	20.48 percent
20 percent	25.00 percent

Credit Expansion and *Ex Nihilo* Deposit Creation by a Sole, Monopolistic Bank

Let us now suppose that k=1. We are dealing either with a sole, monopolistic bank in which borrowers are obliged, because there is no other, to maintain as deposits all funds they are lent; or a situation exists in which all final recipients of payments made by borrowers of the bank are also clients of the bank. (This "ideal" goal would be reached at the merger of all remaining megabanks.) When we substitute the value k=1 into formula [3], we obtain:

$$[6] \qquad x = \frac{d\,(1-c)}{c}$$

Returning to our example in which d=1,000,000 m.u. and c=0.1, if we substitute these values into the formula, we obtain:

$$[7] \quad x = \frac{1{,}000{,}000\,(1-0.1)}{0.1} = \frac{1{,}000{,}000 \cdot 0.9}{0.1} = \frac{900{,}000}{0.1} = 9{,}000{,}000\ m.u.$$

In this case, the bank could alone create *ex nihilo* loans and deposits or fiduciary media for the sum of 9,000,000 m.u., which means it could multiply its total money supply by ten (1,000,000 m.u. originally deposited, plus 9,000,000 m.u. in the form of fiduciary media or deposits created from nothing to back the loans granted by the bank).

Following the example of Bresciani-Turroni,[26] and assuming all payment transactions are carried out between customers of the same bank (given that it is monopolistic, or because certain circumstances exist which produce this situation), we will now use accounting records to show the process leading to this result.

We will now follow the traditional continental system (as opposed to the Anglo-Saxon) in which all payments are registered in the cash account. The following represents the journal at moments t_1, t_2, t_3, . . . t_9, etc., and reflects the bank's practice of repetitively granting its own clients loans for an amount equal to 90 percent of the funds it receives in cash. The clients withdraw the full amount of the loan, but because they have no account in any other bank (or there is no other bank in society), they ultimately deposit the money they receive back into the same bank. This permits the bank, in turn, to grant new loans and generate new deposits, and the process is repeated again and again:

(30)

Bank A
(Journal of the year's operations)

	Debit		Credit	
t_1	1,000,000 Cash		Demand deposits made by Mr. X	1,000,000
t_2	900,000 Loans to U		Cash	900,000

Let us suppose that U withdraws the entire amount of his loan and pays his creditor, A. A is also a customer of U's bank and deposits the 900,000 m.u. he receives. The following entries result:

[26]Bresciani-Turroni, *Curso de economía,* vol. 2: *Problemas de economía política,* pp. 133–38.

t_3	900,000 Cash	Demand deposits made by A	900,000
t_4	810,000 Loans to V	Cash	810,000

We will assume that Borrower V withdraws his money and pays Creditor B, who is also a customer of the bank and deposits his money back into it. This repetitive process continues, producing the following journal entries:

t_5	810,000 Cash	Demand deposits made by B	810,000
t_6	729,000 Loans to Y	Cash	729,000
t_7	729,000 Cash	Demand deposits made by C	729,000
t_8	656,000 Loans to Z	Cash	656,000
t_9	656,000 Cash	Demand deposits made by D	656,000

This occurs again and again, until at the end of the year the bank's total deposits equal:

[8]

$$1{,}000{,}000 + 1{,}000{,}000 \times 0.9 + 1{,}000{,}000 \times 0.9^2 + 1{,}000{,}000 \times 0.9^3 + 1{,}000{,}000 \times 0.9^4 + \ldots = 1{,}000{,}000(1 + 0.9 + 0.9^2 + 0.9^3 + 0.9^4 + \ldots)$$

The above expression represents the sum of the terms in a geometrical progression. The terms increase and have a common ratio of 0.9.[27]

In our example, r=0.9 and a=1,000,000 m.u., and hence the sum of the terms would be equal to:

[13] $$\frac{a}{1-r} = \frac{1{,}000{,}000}{1-0.9} = \frac{1{,}000{,}000}{0.1} = 10{,}000{,}000 \text{ m.u.}$$

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[27]The sum of the sequence:

[9] $Sn = ar + ar + ar^2 \ldots + ar^{n-1}$; if multiplied by the common ratio r, is:

[10] $rSn = ar + ar^2 + ar^3 \ldots + ar^{n-1} + ar^n$; by subtracting [10] from [9], we obtain:

$Sn - rSn = a - ar^n$; and factoring out the common factor on both sides:

$Sn(1 - r) = a(1 - r^n)$; then we isolate Sn:

[11] $$Sn = \frac{a(1-r^n)}{1-r}$$; and when $r < 1$, r^n approaches 0

$$\text{and the } \lim_{n \to \infty} Sn = \lim_{n \to \infty} \frac{a(1-r^n)}{1-r} = \frac{a}{1-r} \text{ ; if } |r| < 1.$$

Therefore we may conclude that:

[12] $$Sn = \frac{a}{1-r} \text{ ; if } |r| < 1$$

The Greek sophist Zeno was the first to pose the problem of adding the terms in a sequence with a common ratio less than one. He addressed the problem in the fifth century B.C., posing the well-known question of whether or not the athlete Achilles would be able to catch the turtle. The problem was not satisfactorily solved, however, because Zeno failed to realize that infinite series with a common ratio less than one have a convergent sum (not a divergent sum, like he believed). See *The Concise Encyclopedia of Mathematics*, W. Gellert, H. Kustner, M. Hellwich and H. Kastner, eds. (New York: Van Nostrand, 1975), p. 388.

If we keep in mind that d represents the 1,000,000 m.u. originally deposited, and that r=1-c; that is, r=1-0.1=0.9, then clearly the sum of all the bank's deposits (original and secondary) would be:

$$[14] \quad \frac{d}{1-(1-c)} = \frac{d}{c}$$

Thus, the total volume of deposits in a monopolistic bank (or in a bank where all those who receive money from the bank's borrowers also ultimately have their accounts) would be equal to the value of the original deposits, d, divided by the reserve ratio, c.

Formula [14] is the simplest version of the so-called *bank multiplier*, and it is identical to formula [27], which yields the same result for a banking system of multiple small banks and appears to have been worked out for the first time by Alfred Marshall in 1887.[28]

We could use the following formula to calculate the net credit expansion the bank brings about *ex nihilo* (in other

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[28]This is how Marshall describes the procedure which led him to this formula:

> I should consider what part of its deposits a bank could lend, and then I should consider what part of its loans would be redeposited with it and with other banks and, vice versa, what part of the loans made by other banks would be received by it as deposits. Thus I should get a geometrical progression; the effect being that if each bank could lend two-thirds of its deposits, the total amount of loaning power got by the banks would amount to three times what it otherwise would be. If it could lend four-fifths, it will then be five times; and so on. The question how large a part of its deposits a bank can lend depends in a great measure on the extent on which the different banks directly or indirectly pool their reserves. But this reasoning, I think, has never been worked out in public, and it is very complex. (Alfred Marshall, "Memoranda and Evidence before the Gold and Silver Commission," December 19, 1887, in *Official Papers by Alfred Marshall* [London: Royal Economic Society, Macmillan, 1926], p. 37)

words, the deposits or fiduciary media generated from nothing to make the credit expansion possible):

$$[15] \qquad x = \frac{d}{c} - d = \frac{d}{c} - \frac{dc}{c}$$

Now we factor out common factors:

$$[16] \qquad x = \frac{d(1-c)}{c}$$

The above formula coincides with [6].

In fact, when d=1,000,000 m.u. and c=0.1, in the case of a monopolistic bank, the net credit expansion would be equal to:

$$[17] \qquad x = \frac{1{,}000{,}000(1-0.1)}{0.1} = 9{,}000{,}000 \text{ m.u.}$$

Therefore the balance sheet of Bank A, a monopolistic bank, would ultimately appear as follows:

(31)

Bank A
(Monopolist)
Balance Sheet

Assets		Liabilities	
Cash	1,000,000	Demand deposits	
Loans to U	900,000	By X	1,000,000
Loans to V	810,000	By A	900,000
Loans to Y	729,000	By B	810,000
Loans to Z	656,000	By C	729,000
.	.	By D	656,000
.	.	.	.
.	.	.	.
Total Assets	10,000,000	Total Liabilities	10,000,000

With only 1,000,000 m.u. in original deposits safeguarded in its vault, Bank A, a monopolist, has expanded credit by granting loans for the sum of 9,000,000 m.u. and creating from nothing 9,000,000 m.u. in new deposits or fiduciary media to back these loans.[29]

5
Credit Expansion and New Deposit Creation by the Entire Banking System

We have already observed the great capacity isolated banks have for creating fiduciary loans and deposits. In fact, they are normally able to double their money supply on their own. We will now see how the fractional-reserve banking system as a whole generates *ex nihilo* a much larger volume of

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[29]Also relevant is the formula for the maximum credit expansion an isolated bank can bring about based not on the money it receives in original deposits, but on the reserves it holds, r, in excess of the required amount, cd. In this case, the decrease in reserves which results from the new expansion $x(1-k)$ must be equal to the excess reserves, r, minus the reserve ratio corresponding to the portion of loans unused, $k \cdot c \cdot x$. In other words:

[18] $$(1-k)x = r - k \cdot c \cdot x$$
$$k \cdot c \cdot x + (1-k)x = r$$
$$x(kc + 1 - k) = r$$

[19] $$x = \frac{r}{kc + 1 - k}$$

If, as in our example, we suppose that an original deposit of 1,000,000 m.u. is made, c=0.1 and k=0.2, the excess of reserves is precisely r=900,000, and therefore:

[20] $$x = \frac{900{,}000}{0.2 \cdot 0.1 + 1 - 0.2} = \frac{900{,}000}{1.02 - 0.2} = \frac{900{,}000}{0.82} = 1{,}097{,}560 \ m.u.$$

This, of course, is exactly the same result we obtained with formula [4].

deposits and brings about much greater credit expansion. Indeed, in this respect the fractional-reserve system produces effects resembling those of a monopolistic bank. We will base our demonstration on the most general case, a banking system comprised of a group of normal banks, each of which maintains cash reserves, *c*, of 10 percent. Also, on average, the customers of each fail to withdraw 20 percent of loans granted (or 20 percent of fiduciary media return to the bank because a significant number of the final recipients are also clients of the bank). Hence, *k*=20 percent.

Let us suppose that Mr. X deposits 1,000,000 m.u. in Bank A. The bank would then make the following entry in its journal:

Bank A

(32) Debit		Credit	
1,000,000	Cash	Demand deposits (made by X)	1,000,000

Bank A would then be able to create and grant loans to Z for a sum determined by the formula in [3]. The following entry would result:

Bank A

(33) Debit		Credit	
1,097,560	Loans to Z	Demand deposits	1,097,560

And since *k*=0.2, 80 percent of loans granted would be withdrawn, resulting in the following entry:

Bank A

(34) Debit		Credit	
878,048	Demand deposits	Cash	878,048

The balance sheet of Bank A following these entries would look like this:

(35)

Bank A
Balance Sheet
c=0.1 and *k=0.2*

Assets		Liabilities	
Cash	121,952	Demand deposits	1,219,512
Loans	1,097,560		
Total Assets	1,219,512	Total Liabilities	1,219,512

Let us suppose that when Z withdraws his deposit he pays Y, who is a customer of Bank B and deposits the money there. Three entries parallel to the above three would result. Formula [3] would again be used to determine the amounts.

Bank B

(36) Debit		Credit	
878,048	Cash	Demand deposits (made by Y)	878,048
963,710	Loans to V	Demand deposits	963,710
770,969	Demand deposits	Cash	770,969

After these operations, Bank B's balance sheet would appear as follows:

(37)

Bank B
Balance Sheet
c=0.1 and *k=0.2*

Assets		Liabilities	
Cash	107,079	Demand deposits	1,070,789
Loans	963,710		
Total Assets	1,070,789	Total Liabilities	1,070,789

If we imagine that V pays his debts to U, who in turn deposits the money he receives in his bank, Bank C, then the following journal entries would result:

Bank C

(38) Debit		Credit	
770,969	Cash	Demand deposits (made by U)	770,969
846,185	Loans to R	Demand deposits	846,185
676,948	Demand deposits	Cash	676,948

The bank would make this last entry when R withdraws 80 percent (*k*=0.2) of his loan from Bank C to pay his creditors (T, for example).

Once these operations have been completed, Bank C's balance sheet would appear as follows:

(39)

Bank C
Balance Sheet
c=0.1 and *k=0.2*

Assets		Liabilities	
Cash	94,021	Demand deposits	940,206
Loans	846,185		
Total Assets	940,206	Total Liabilities	940,206

And if Creditor T, upon receiving the money he was owed, deposits it in his own bank, Bank D, these entries would result:

(40)

Bank D

Debit		Credit	
676,948	Cash	Demand deposits (made by T)	676,948
742,992	Loans to S	Demand deposits	742,992
594,393	Demand deposits	Cash	594,393

The bank would make this last entry in its journal when S pays his creditors.

At this point, Bank D's balance sheet would appear as follows:

(41)

Bank D
Balance Sheet
c=0.1 and *k=0.2*

Assets		Liabilities	
Cash	82,555	Demand deposits	825,547
Loans	742,992		
Total Assets	825,547	Total Liabilities	825,547

The process continues in this way, and the chain of deposits and loans extends to all banks in the system. Once the effects of the original deposit of 1,000,000 m.u. have completely disappeared, the total deposits created by the banking system would be the sum of the following sequence:

[21]

$$1{,}219{,}512 + 1{,}219{,}512 \times 0.878 + 1{,}219{,}512 \times 0.878^2 + \ldots$$

$$= a + ar + ar^2 + \ldots = \operatorname{Lim} \sum_{n=0}^{\infty} ar^n; \text{ where } a = 1{,}219{,}512$$

and the common ratio $r = (1 - k)\ \dfrac{(1 - c)}{1 + k(c - 1)}$

This is due to the fact that, in our example, r would be equal to 80 percent $(1 - k)$ of the proportion of deposits newly created by each bank at each stage. This proportion comes from formula [3] and is equal to:

$$\frac{(1 - c)}{1 + k(c - 1)}$$

Therefore: [22]

$$\mathrm{r} = (1 - 0.2)\ \frac{1 - 0.1}{1 + 0.2(0.1 - 1)} = 0.8 \cdot \frac{0.9}{1 + 0.2(0.1 - 1)} = \frac{0.72}{1 - 0.18}$$

$$= \frac{0.72}{0.82} = 0.87804878$$

And since $|r| < 1$, we apply formulas [11] and [12].

$$[23] \quad \sum_{n=0}^{\infty} = ar^n = \frac{a}{1-r} = \frac{1{,}219{,}512}{0.1219512} = 10{,}000{,}000 \text{ m.u.}$$

Thus the sum of the deposits in the banking system, D, would be equal to:

$$[24] \quad D = \frac{ds_1}{1 - \frac{(1-k)(1-c)}{1+k(c-1)}} = 10{,}000{,}000 \text{ m.u.}$$

In this example, ds_1 represents Bank A's secondary deposits and equals 1,219,512 m.u.

The net credit expansion, x, brought about by the entire banking system would equal:

$$[25] \quad x = D - d = 10{,}000{,}000 - 1{,}000{,}000 = 9{,}000{,}000$$

A summary of these results appears in Table IV-1 and Chart IV-1. Details are given for each member bank in the banking system.

Creation of Loans in a System of Small Banks

Let us now suppose that all the banks in the system are very small. They each have a k equal to zero and a c equal to 0.1. If we follow the pattern of past entries, the journal entries for this banking system would look like this:

TABLE IV-1
SYSTEM OF "NORMAL"-SIZED BANKS
(k=0.2 and *c=0.1)*

	Money remaining in each bank's vault	*Credit expansion (Loans created ex nihilo)*	*Deposits*
Bank A	122,000	1,098,000	1,220,000
Bank B	107,100	964,000	1,071,000
Bank C	94,000	846,000	940,000
Bank D	82,600	643,000	826,000
Bank E	72,500	652,000	725,000
Bank F	63,700	573,000	637,000
Bank G	55,900	503,000	559,000
Bank H	49,100	442,000	491,000
Bank I	43,000	387,000	430,000
Bank J	37,800	340,000	378,000
. .	.	.	.
. .	.	.	.
Banking system totals	*d*=1,000,000	*x=D-d*=9,000,000	*D*=10,000,000

Note: The last three digits have been rounded.

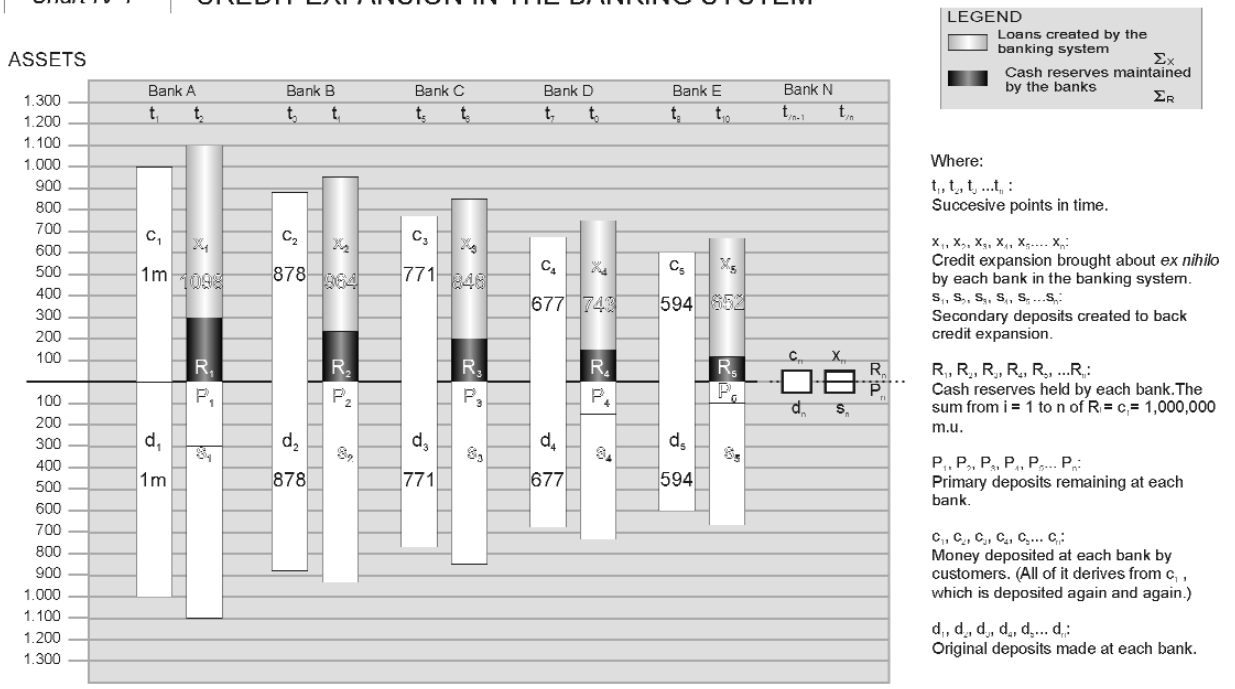
When a demand deposit of 1,000,000 m.u. is made at Bank A:

Bank A

(42) Debit		Credit	
1,000,000	Cash	Demand deposits	1,000,000
900,000	Loans to Z	Demand deposits	900,000
900,000	Demand deposits	Cash	900,000

Chart IV-1

CREDIT EXPANSION IN THE BANKING SYSTEM*



LEGEND
Loans created by the banking system Σ_X
Cash reserves maintained by the banks Σ_R

Where:

$t_1, t_2, t_3 \ldots t_n$:
Succesive points in time.

$x_1, x_2, x_3, x_4, x_5 \ldots x_n$:
Credit expansion brought about *ex nihilo* by each bank in the banking system.
$s_1, s_2, s_3, s_4, s_5 \ldots s_n$:
Secondary deposits created to back credit expansion.

$R_1, R_2, R_3, R_4, R_5, \ldots R_n$:
Cash reserves held by each bank.The sum from i = 1 to n of $R_i = c_i$ = 1,000,000 m.u.

$P_1, P_2, P_3, P_4, P_5 \ldots P_n$:
Primary deposits remaining at each bank.

$c_1, c_2, c_3, c_4, c_5 \ldots c_n$:
Money deposited at each bank by customers. (All of it derives from c_1 , which is deposited again and again.)

$d_1, d_2, d_3, d_4, d_5 \ldots d_n$:
Original deposits made at each bank.

(Note: due to space limitations, areas R and P do not correspond exactly to their real value.)

**An adaptation of the chart presented by C.A. Philips in* Bank Credit, *op.cit.,p.61.*

When Z withdraws 900,000 m.u. to pay Y, Bank A's balance sheet would appear as follows:

(43) Bank A

Balance Sheet
c=0.1 and *k=0*

Assets		Liabilities	
Cash	100,000	Demand deposits	1,000,000
Loans to Z	900,000		
Total Assets	1,000,000	Total Liabilities	1,000,000

If Y, in turn, deposits the 900,000 m.u. in his bank, Bank B, also a small bank with a k equal to zero and a c equal to 0.1, the following journal entries would result:

Bank B

(44) Debit		Credit	
900,000	Cash	Demand deposits	900,000
810,000	Loans to V	Demand deposits	810,000
810,000	Demand deposit	Cash	810,000

And Bank B's balance sheet would look like this:

(45) Bank B

Balance Sheet
C=0.1 and *k=0*

Assets		Liabilities	
Cash	90,000	Demand deposits	900,000
Loans to V	810,000		
Total Assets	900,000	Total Liabilities	900,000

Now, if V withdraws the loan from his bank to pay U, and U deposits the money in his bank, Bank C, also a small bank with a *k* equal to zero and a *c* equal to 0.1, these would be Bank C's entries:

Bank C

(46) Debit		Credit	
810,000	Cash	Demand deposits	810,000
729,000	Loans to T	Demand deposits	729,000
729,000	Demand deposits	Cash	729,000

And Bank C's balance sheet would look like this:

(47)

Bank C
Balance Sheet
C=0.1 and *k=0*

Assets		Liabilities	
Cash	81,000	Demand deposits	810,000
Loans to T	729,000		
Total Assets	810,000	Total Liabilities	810,000

When T pays his creditor, S, and S deposits the money in his bank, Bank D, also small, with a *k* equal to zero and a *c* equal to 0.1, the following entries would result:

Bank D

(48) Debit		Credit	
729,000	Cash	Demand deposits	729,000
656,100	Loans	Demand deposits	656,100
656,100	Demand deposits	Cash	656,100

In turn, Bank D's balance sheet would appear as follows:

(49)

Bank D
Balance Sheet
c=0.1 and *k=0*

Assets		Liabilities	
Cash	72,900	Demand deposits	729,000
Loans to T	656,100		
Total Assets	729,000	Total Liabilities	729,000

The total deposits in a system of very small banks is equal to the sum of a sequence identical to the one in formula [8], which referred to a monopolistic bank:

[26] $1{,}000{,}000 + 1{,}000{,}000 \times 0.9 + 1{,}000{,}000 \times 0.9^2 +$

$1{,}000{,}000 \times 0.9^3 + \ldots = Lim \sum_{n=0}^{\infty} ar^n;$

where a=1,000,000 and r=0.9.

As shown in footnote 27, this sum is in turn equal to:

$$\frac{a}{1-r} = \frac{a}{1-(1-c)} = \frac{a}{c} = \frac{1{,}000{,}000}{0.1} = 10{,}000{,}000$$

As a=d=1,000,000 m.u. originally deposited, the total deposits would be indicated by the formula:

[27] $$\frac{d}{1-(1-c)} = \frac{d}{c}$$

This formula is identical to the deposit multiplier in the case of a single, monopolistic bank [14].

Let us also remember that:

[28] $$r = (1-k)\,\frac{1-c}{1+k(c-1)}$$

In view of the fact that the banking system is in this case composed of small banks and k=0, if we substitute this value for k in formula [28], we obtain r=1-c=0.9, which we already knew.

Therefore, an entire banking system comprised of small banks brings about a volume of deposits (10,000,000 m.u.) and a net credit expansion (9,000,000 m.u.) identical to those of a monopolistic bank for which k=1. These results are summarized in Table IV-2.

A system of small banks (where k=0) is clearly an exception within the overall banking system (where k is less than 1 but greater than 0). However, it is an easy example to understand and therefore in textbooks is generally the model used to explain the creation of credit money by the financial system.[30]

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[30]See, for example, Juan Torres López, *Introducción a la economía política* (Madrid: Editorial Cívitas, 1992), pp. 236–39; and José Casas Pardo, *Curso de economía*, 5th ed. (Madrid, 1985), pp. 864–66.

TABLE IV-2
SYSTEM OF SMALL BANKS
(k=0 and *c=0.1)*

	Money remaining in each bank's vault	*Credit expansion (Loans created ex nihilo)*	*Deposits*
Bank A	100,000	900,000	1,000,000
Bank B	90,000	810,000	900,000
Bank C	81,000	729,000	810,000
Bank D	72,900	656,000	729,000
Bank E	65,600	590,000	656,000
Bank F	59,000	531,000	590,000
Bank G	53,100	478,000	531,000
Bank H	47,800	430,000	478,000
Bank I	43,000	387,000	430,000
Bank J	38,700	348,000	387,000
. .	.	.	.

Banking System totals d=1,000,000 $x = \frac{d(1-c)}{c}$ = 9,000,000 $\frac{d}{c}$ = 10,000,000

Note: The last three digits have been rounded.

It is also true that a banking system composed of one monopolistic bank (when k=1) is a unique instance within the broader category of isolated banks which expand deposits and loans.

To conclude, two particular cases lead to identical results regarding new loans created (9,000,000 m.u.) and the total volume of deposits (10,000,000 m.u.). The first case is a banking system made up of tiny banks, each with a k equal to zero. The second is an isolated bank with a k equal to one. Given that both cases are easy to comprehend, they are generally chosen as examples in textbooks to explain the creation of loans and the volume of deposits generated by the banking system.

Depending upon the text, the author refers either to a system of tiny banks or to a single, monopolistic bank (or one whose customers are the final recipients of the loans it grants).[31]

6
A Few Additional Difficulties

When Expansion is Initiated Simultaneously by All Banks

In light of the fact that in this context we are forced to offer a simplified view of the processes of credit expansion, it is now necessary to make a few supplementary points and clarifications. To begin with, the expansion process we have described originates entirely from an increase in money deposited at the original bank (in our example, *d* represents 1,000,000 m.u. deposited in Bank A). Nevertheless, both historically, as banking developed, and currently, all processes of credit expansion have been characterized by the fact that the new money reaches the banking system not through one single bank, but through many (if not, to a larger or smaller extent, through all the banks in the system). As Richard G. Lipsey reveals,[32] credit expansion such as we have described, which takes place *ex nihilo* and is backed by the creation of the necessary bank deposits, *will recur as often as 1,000,000 m.u. are deposited in any of the different banks. Therefore, the widespread expansion process is, in practice, much more substantial and qualitatively more complicated, since it originates simultaneously at many banks and from many deposits*. In our example alone, which involved a reserve ratio of 10 percent, loans for the sum of 9,000,000 m.u. were ultimately created, an amount nine times larger than the original deposit, and as a result the total money supply was multiplied by ten. The main conclusion to be drawn is that if all banks simultaneously receive new deposits of money, they will be able to

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[31]This is the example Bresciani-Turroni prefers to follow in his book, *Curso de economía*, vol. 2, pp. 133–38.

[32]Richard G. Lipsey, *An Introduction to Positive Economics*, 2nd ed. (London: Weidenfeld and Nicolson, 1966), pp. 682–83.

expand credit without having to decrease their cash reserves, because although they grant loans which could lead to a withdrawal of cash (as we have supposed up until now in the accounting entries), they simultaneously receive the deposit of a portion of the money loaned by other banks. Hence *in practice, significant decreases in each bank's reserves will not necessarily occur, and each bank, while maintaining its reserves practically intact, will be able to make loans and therefore create deposits without serious risk.*

This theoretical argument has prompted various authors, among them Murray N. Rothbard,[33] to write about the process of credit expansion in the banking system from the viewpoint that an isolated bank does not lose reserves when it grants new loans. Instead, while maintaining the volume of its reserves intact, it makes every attempt to make new loans for a multiple determined by the inverse of the reserve ratio. The argument for explaining the bank multiplier in this way, even in the case of an isolated bank, is that the bank will attempt to avoid reducing its reserves in the process of granting loans (i.e., the banker will not wish to keep 100,000 m.u. and loan 900,000). Instead, it is much more advantageous for the bank to maintain its reserve ratio by loaning a much larger amount of money and keeping the initial cash reserves unaltered (that is, by holding 1,000,000 m.u. in cash and creating *ex nihilo* 9,000,000 m.u. in new loans). In practice, the level of cash reserves can be ensured if the credit expansion process takes place *simultaneously* at all banks. This is because the decrease in cash a bank experiences upon granting loans will tend to be compensated for by the reception of new deposits originating in loans made by other banks.

When the expansion process is presented in this way, it is not often easily understood by nonspecialists, nor even by professionals in the banking sector, who are accustomed to considering their "business" mere intermediation between depositors and borrowers. However, clear evidence that the

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[33]Rothbard, *The Mystery of Banking*, chap. 8, pp. 111–24.

approach of Rothbard and others is totally correct lies in the fact that for our purposes it makes no difference whether we study the case examined up to this point (an original deposit, extended throughout the banking system, of 1,000,000 m.u. in Bank A), or we consider a banking system comprised of ten banks, each of which simultaneously receives a deposit of 100,000 m.u. (i.e., a total of 1,000,000 m.u. divided among ten banks). In the latter case, each bank will keep unaltered 100,000 m.u. in cash, making it possible for the banks to expand their loans and create *ex nihilo* new fiduciary media for the sum of 900,000 m.u. Each bank will be able to maintain stable cash reserves of 100,000 m.u. if possible reductions in these reserves as the result of loans granted are offset by new deposits originating from loans made by other banks. Therefore if all of the banks bring about expansion simultaneously, each one is able to maintain its cash reserves unaltered, and with a reserve ratio of 0.1, create from nothing, in the form of loans backed by new fiduciary media, up to nine times its initial deposits. Let us examine this process of simultaneous expansion in terms of accounting entries.

We will assume that each of ten banks receives 1,000,000 m.u. in new, original deposits of money. The ten banks are all of the same size, and each has a reserve ratio, c, of 10 percent, and (to keep it simple) a k equal to zero. Let us also suppose that each bank has a market share of 10 percent. In other words, each bank receives the business of 10 percent of all the customers in the market in which it operates. Moreover, these customers are randomly distributed. If these banks simultaneously begin to expand credit according to the process described in entries (42) and following, it is obvious that any one of them, for example Bank A, will eventually receive deposits coming from loans granted by the other banks, as shown in Table IV-2. If all of the banks expand credit simultaneously, Bank A's journal entries would appear as follows:

(50)

Bank A

Debit		Credit	
1,000,000	Cash	Demand deposits	1,000,000
900,000	Loans	Demand deposits	900,000
900,000	Demand deposits	Cash	900,000

This decrease in cash would be counteracted by a demand deposit from a final recipient of a loan granted, for example, by Bank B, resulting in the following entries:

(51)

Bank A

Debit		Credit	
900,000	Cash	Demand deposits from loans granted by Bank B	900,000
810,000	Loans	Demand deposits	810,000
810,000	Demand deposits	Cash	810,000

Bank A would eventually recuperate these 810,000 m.u. in the form of a deposit originating from loans granted, for example, by Bank C. The journal entries would look like this:

(52) Bank A

Debit		Credit	
810,000	Cash	Demand deposits from loans granted by Bank C	810,000
729,000	Loans	Demand deposits	729,000
729,000	Demand deposits	Cash	729,000

As this process continues, Bank A would receive deposits from the recipients of loans granted by Banks D, E, F, G, H, I, and J. We have greatly simplified the process in our explanation. In reality, the bank receives, on average, 10 percent of the ten loans of 900,000 m.u. granted in the first stage by each bank in the system. It then receives 10 percent of the ten loans of 810,000 m.u. made by each of the banks in the second phase, 10 percent of the ten loans of 729,000 m.u. made by each in the third phase, etc.

Hence, if we suppose that each of ten banks receives 1,000,000 m.u. in original deposits, and the banks expand credit simultaneously, the balance sheet of any of them, Bank A, for instance, would appear as follows:

(53) Bank A
Balance Sheet
c=0.1 and *k=0*

Assets		Liabilities	
Cash	1,000,000	Demand deposits (primary)	1,000,000
Loans	9,000,000	Demand deposits (secondary)	9,000,000
Total Assets	10,000,000	Total Liabilities	10,000,000

Therefore, the balance sheet of each bank would coincide with the one we discovered when we assumed k was equal to one (a monopolistic bank or one whose clients are the ultimate recipients of the loans it grants). This is due to the fact that although in this case there is no monopoly, the loss of cash each bank initially experiences upon expanding credit is eventually offset by deposits originating in loans expanded by the other banks.

We may conclude from balance sheet (53) that each banker need not reduce his cash reserves to expand his bank's credit; instead, if the rest of his colleagues expand their credit at the same time, he can maintain his level of cash reserves unaltered and proceed directly to grant loans for a sum equal to a multiple of his reserves. (In our case, each banker holds 1,000,000 m.u. in cash reserves and creates from nothing 9,000,000 m.u. in loans backed by 9,000,000 m.u. in secondary deposits.) Therefore Rothbard's interpretation of the process is correct even in the case of an isolated bank, when each of the other banks in the system also receive original deposits (that is, a proportional amount of the new money created in the system) and all expand their credit simultaneously. The cash each bank would theoretically lose by granting loans is counteracted by deposits received from recipients of loans expanded by the banker's colleagues. Thus each bank can alone expand its credit for the sum of 9,000,000 m.u. In turn, the system's total expansion would be equal to 90,000,000 m.u., and the amount of total deposits or the money supply would be 100,000,000 m.u.

We can achieve numerical results identical to those in Table IV-2 simply by supposing that an original deposit of 1,000,000 m.u. is made at Bank A and is divided equally among the ten banks in the system, each of which receives 100,000 m.u. Those 100,000 m.u. would remain unaltered in each bank's vault. Each bank could expand its credit by 900,000 m.u., and therefore the entire banking system could generate 9,000,000 m.u. in new loans and a total of 10,000,000 m.u. in primary and secondary deposits.

Obviously this last example, which wraps up our accounting analysis of the expansion of loans and deposits by isolated

banks and banking systems, is the most realistic. In the current monetary system, increases in the money supply filter throughout the system and reach practically all banks, permitting them to expand their credit simultaneously according to the processes we have studied. In addition, there are clear historical indications that banks have never emerged alone, but in groups. Even Saravia de la Calle mentions that bankers established themselves in groups, offering "guarantors and acting as guarantors for each other."[34] This means that by the time of the sixteenth-century Castilian markets, bankers were already aware of the intimate relationship and strong community of interests uniting them in terms of the success or failure of their businesses, and they realized they needed to support one another mutually.

With respect to the gold standard and a money supply based on the discovery of new gold mines and on the development of extraction techniques, we can assume that new money originating from substantial, new discoveries would initially reach only a few bankers, and from there it would extend throughout the rest of the banking system. Therefore, it would not set off a process of simultaneous expansion, but a gradual process by which the money would filter throughout the entire system.

We can conclude that if there are many banks and many new deposits, and the banks expand their credit simultaneously following the processes we have studied, even an isolated bank will be able to maintain a stable level of reserves and by itself expand loans and deposits for a multiple of this level, an amount determined by the inverse of the reserve ratio (when k=0).[35] Therefore it is obviously only in the

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[34]Saravia de la Calle, *Instrucción de mercaderes*, p. 180.

[35]Under these circumstances, which most closely resemble actual market conditions, Phillips's statement loses credibility. In his words (*Credit Banking*, p. 64), "It follows for the banking system that deposits are chiefly the offspring of loans. For an individual bank, loans are the offspring of deposits." This second affirmation is the incorrect one under true conditions. This is due to the fact that, given the existence of many

account books that deposits back the wealth bankers appropriate upon expanding their credit. From an accounting (but not a legal) standpoint, the formal ownership of these loans corresponds to the deposit-holders, since under normal circumstances they consider their deposits money (perfect money substitutes) they can use in their transactions without ever having to withdraw them in physical monetary units. Nonetheless, it is clear that the assets generated by the banking system do not actually belong to anyone. To a large extent, however, they could be considered the property of banks' shareholders, directors and administrators, the people who actually take advantage of many of the economic benefits of this wealth, with the additional advantage of not appearing as the owners, since the account books indicate that the depositors own the wealth.

In other words, under normal conditions, deposits come from loans and are merely a secondary result, reflected in the account books, of the wealth banks accumulate and retain indefinitely. We will return to this topic later in the book, in a discussion on banknotes and in the last chapter, where we present our proposal for a process of banking reform.

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banks and many original deposits, and considering that these banks expand credit simultaneously, the deposits of each individual bank are also a result of the credit expansion carried out by all of the banks in unison. In chapter 8 we will examine the distinct possibility (denied by Selgin) that, even in a free-banking system, all banks might simultaneously initiate credit expansion, even when the volume of primary deposits does not increase in all of them (that is, through a generalized decrease in their cash or reserve ratio). In the same chapter, we will explain, as Mises has done, that in a free-banking system, any bank which unilaterally expands its credit by reducing its cash reserves beyond a prudent level will endanger its own solvency. These two phenomena account for the universal tendency of bankers to agree among themselves to jointly orchestrate (usually through the central bank) a uniform rate of credit expansion.

Filtering Out the Money Supply From the Banking System

Another complexity derives from the fact that in reality, each time loans are granted and deposits are created and withdrawn, a certain percentage of the money supply "filters" out of the system and is kept by individuals who do not wish to deposit it in a bank. The larger the percentage which physically "filters" into the pockets of individuals at each stage and remains outside the banking system, the smaller the bank's expansive capacity to generate new loans.

In a system of small banks (in which $k = 0$) with a reserve requirement of 10 percent ($c = 0.1$), if f refers to the proportion of the money supply that filters out of the banking system and $f = 0.15$, then when Bank A loans 900,000 m.u., the amount of money which would return to the banking system would be equal to $(1 - f)$ 900,000 = (1 – 0.15) 900,000 = 0.85 x 900,000 = 765,000 m.u. Therefore if we are dealing with a system of small banks and we assume that $k=0$, $c=0.1$ and $f=0.15$, we can use the following formulas:

If D_N refers to the total net deposits, which are comprised of gross deposits, D_G, minus the total sum of money, F, that filters out of the banking system, then:

[29] $$D_N = D_G - F$$

The total sum of money that filters out of the banking system will logically be equal to f times the total sum of gross deposits, D_G, where f is the percentage of money which filters out of the system. That is:

[30] $$F = fD_G$$

In turn, the amount of money initially deposited is equal to the sum of net deposits multiplied by the corresponding reserve ratio plus the total sum which has filtered out of the system:

[31] $$d = D_N \cdot c + F$$

If we substitute into this equation the value of D_N in formula [29] and the value of F in [30], we obtain:

[32] $$d = (D_G - F) \cdot c + fD_G$$

If we replace F in the equation with fD_G, we obtain:

[33] $$d = (D_G - fD_G)c + fD_G$$

Then we factor out D_G:

[34] $$d = D_G\,(c - cf\ + f)$$

And therefore:

[35] $$D_G = \frac{d}{c - cf + f}$$

As $D_N = D_G(1\text{-}f)$,

[36] $$D_N = D_G(1-f) = \frac{d(1-f)}{c - cf + f} = \frac{d(1-f)}{c(1-f) + f} = \frac{d}{c + \dfrac{f}{1-f}}$$

This would be the formula for the net deposits created by the banking system. The credit expansion brought about by a banking system out of which some money filters would be equal to:

[37] $$x = D_N - d = \frac{d}{c + \dfrac{f}{1-f}} - d$$

If we substitute a value of zero for f in the preceding formulas, we are left with the same equations we have used until

now to determine the total volume of deposits and the total credit expansion:

[38] $$D_N = \frac{d}{c} = \frac{1{,}000{,}000}{0.1} = 10{,}000{,}000$$

and

[39] $$x = \frac{d}{c} - d = \frac{d(1-c)}{c} = \frac{1{,}000{,}000(0.9)}{0.1} = 9{,}000{,}000$$

Let us see to what value credit expansion is reduced if, as before, $d = 1{,}000{,}000$ m.u. and $c = 0.1$, while in addition 15 percent of the money supply filters out of the banking system ($f = 0.15$).

[40]

$$D_N = \frac{1{,}000{,}000}{0.1 + \frac{0.15}{1 - 0.15}} = \frac{1{,}000{,}000}{0.1 + \frac{0.15}{0.85}} = \frac{0.85 \text{ x } 1{,}000{,}000}{0.085 + 0.15} =$$

$$\frac{850{,}000}{0.235} = 3{,}617{,}021$$

Hence, in a banking system where 15 percent of the money supply filters out of the system, the total sum of deposits would be 3,617,021 m.u., instead of 10,000,000 m.u., as is the case when $f = 0$.

The net credit expansion would be equal to x = 3,617,021 - 1,000,000 = 2,617,021, instead of the 9,000,000 m.u. which are created when no money filters out of the system. Therefore, when the percentage of money which filters out is greater than zero, the capacity of the banking system to create loans and generate deposits *ex nihilo* decreases noticeably.[36]

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[36]We have arrived at these formulas following the process described by Armen A. Alchian and William R. Allen in *University Economics* (Belmont, Ca.: Wadsworth Publishing, 1964), pp. 675–76. If the legal reserve requirement were reduced to zero, as is increasingly demanded, the total sum of net deposits, D_N, would be:

The Maintenance of Reserves Exceeding the Minimum Requirement

Another complication which produces effects similar to those covered in the preceding section takes place when banks hold cash reserves exceeding the minimum requirement. This tends to occur at certain stages in the economic cycle in which banks behave relatively more prudently, or they are obliged to increase their reserves due to difficulties in finding enough creditworthy borrowers willing to request loans, or both. This occurs, for example, in the phases of economic recession that follow credit expansion. At any rate, the maintenance of cash reserves exceeding the necessary level reduces the system's capacity for credit expansion in the same way as *f*, a percentage of the money supply which filters out of the banking system.[37]

$$D_N = \frac{d}{\frac{f}{1-f}} = \frac{d(1-f)}{f} = \frac{1{,}000{,}000(0.85)}{0.15} = 5{,}666{,}667 \text{ m.u.}$$

And the net credit expansion, x:

$$x = D_N - d = 4{,}666{,}667 \; m.u.$$

Therefore we must conclude that if no portion of the money supply were to filter out of the system ($f = 0$), and the banking authorities were to eliminate the reserve requirement ($c = 0$), these authorities could drive the volume of credit expansion as high as they chose, since:

$$D_N = \frac{d}{0} = \infty$$

(This expansion would bring about numerous disruptive effects on the real productive structure, on which its impact would be severe. See chapter 5.)

[37]To illustrate how significantly the above factors can contribute to a decrease in the bank expansion multiplier, we must first note that in Spain, for instance, the total money supply consists of about 50 trillion pesetas (166.386 pesetas = 1 euro), which includes cash held by the

Different Reserve Requirements for Different Types of Deposits

Finally, another complication we could consider derives from the fact that in many countries the reserve requirement for demand deposits differs from the requirement for time deposits, even though as we know, in practice the latter are often true demand deposits. Although the formulas we have considered up until now could be worked out again for both deposit types, the degree of complexity involved would not be worth the slight additional value the analysis could afford, so we have chosen not to do so here.[38]

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public, demand deposits, savings deposits and time deposits. (In the Spanish banking system, despite their name, time deposits are usually true demand deposits, because they can be withdrawn at any time without penalty or with a very small penalty). Of the total money supply, only about 6.6 trillion pesetas are in the form of cash in the hands of the public. This means that a little over 13.2 percent of the total corresponds to this cash held by the public, and therefore the bank expansion multiplier in Spain would be greater than 7.5 times (which would be equal to a reserve ratio of 13.2 percent). Since the current reserve requirement in Spain is 2 percent (from the Bank of Spain's monetary circular 1/1996, October 11, and confirmed afterward by European Central Bank regulations), the difference between that and 13.2 percent can be attributed to the influence of *f*, the percentage of money which filters out of the system and into the pockets of private citizens. Perhaps the past economic recession has played a role by increasing the volume of cash and deposits held by banks and temporarily reducing their potential for boosting credit expansion. Our comments are based on provisional data from June published in August 1994 in the *Boletín Estadístico del Banco de España*, kindly supplied by Luis Alfonso López García, an inspector from the Bank of Spain.

[38]Nevertheless, the relevant formulas are devised in Laurence S. Ritter and William L. Silber, *Principles of Money, Banking and Financial Markets*, 3rd rev., updated ed. (New York: Basic Books, 1980), pp. 44–46. Other writings which cover in detail the formulation of the bank multiplier theory are: John D. Boorman and Thomas M. Havrilesky, *Money Supply, Money Demand and Macroeconomic Models* (Boston: Allyn and Bacon, 1972), esp. pp. 10–41; Dorothy M. Nichols, *Modern Money Mechanics: A Workbook on Deposits, Currency and Bank Reserves*, published by the Federal Reserve Bank of Chicago, pp. 29–31; and the interesting book by

7
The Parallels Between the Creation of Deposits and the Issuance of Unbacked Banknotes

The economic analysis of the issuance of unbacked banknotes, an operation which emerged long after the discovery of fractional-reserve banking, is not one of the main purposes of this book.[39] However it could be useful at this point to consider in some detail the accounting and legal aspects of the issuance of unbacked banknotes, since as we will demonstrate, its effects are identical to those produced by banks' creation of loans and deposits from nothing.

Let us imagine that banking is just beginning to emerge, and banks act as true depositaries of money as stipulated in an irregular deposit contract. As long as the general legal principles we studied in chapters 1 through 3 are upheld, banks will accept monetary units (usually gold or any other type of commodity money) and keep them in their vaults, and in return they will give depositors deposit certificates, receipts or banknotes for the entire sum deposited. A bank which correctly honors its commitments will make the following entry in its journal:

Bank A

(54)	Debit		Credit	
1,000,000	Cash		Deposit receipts or banknotes	1,000,000

Phillip Cagan, *Determinance and Effects of Changes in the Stock of Money, 1875–1960* (New York: Columbia University Press, 1965). Also, José Miguel Andreu García has written extensively on the topic of bank multipliers and reserve requirements. For example, see his articles, "En torno a la neutralidad del coeficiente de caja: el caso español," in *Revista de Economía*, no. 9, and "El coeficiente de caja óptimo y su posible vinculación con el déficit público," *Boletín Económico de Información Comercial Española* (June 29–July 5, 1987): 2425ff.

[39]Usher, *The Early History of Deposit Banking in Mediterranean Europe*, pp. 9 and 192.

If the bank fulfills its commitments for a lengthy period of time and people completely trust it, it is certain that the public will gradually begin to use the banknotes (or the deposit slips or receipts the bank issues in exchange for monetary units deposited) as if they were the units of commodity money themselves, thus converting the banknotes into monetary units (perfect money substitutes, to use Mises's terminology). Given that money is a present good people need and use only as a medium of exchange and not for their own consumption, if depositors trust the bank, their use of banknotes as money could be prolonged indefinitely (they would not need to go to the bank and withdraw the monetary units they originally deposited). When this situation arises, bankers may start to feel tempted to issue deposit receipts for an amount exceeding the sum of monetary units actually deposited.

Clearly if bankers succumb to this temptation, they violate universal legal principles and commit not only the crime of counterfeiting (by issuing a false receipt unbacked by a corresponding deposit), but the crime of fraud as well, by presenting as a means of payment a document that in reality lacks all backing.[40] Nevertheless, if people place enough trust in the bank and the banker knows from experience that a reserve ratio, c, of 0.1 will permit him to honor his commitments under ordinary circumstances, he will be able to issue up to nine times more in new false deposit receipts or banknotes. His corresponding journal entry will appear as follows:

Bank A

(55)	Debit		Credit	
9,000,000	Loans		Banknotes	9,000,000

[40] He who has made a special promise to give definite parcels of goods in return for particular individual papers, cannot issue any such promissory papers without holding corresponding goods. If he does so, he will be continually liable to be convicted of fraud or default by the presentation of a particular document. (Jevons, *Money and the Mechanism of Exchange*, p. 209)

We have assumed the bank uses the counterfeit bills to grant loans, but it could use them for any purpose, for example to purchase any other asset (like lavish buildings) or simply to pay day-to-day expenses. If the bank uses the bills to grant loans, its balance sheet will appear as follows:

(56)

Bank A
Balance Sheet

Assets		Liabilities	
Cash	1,000,000	Banknotes	10,000,000
Loans	9,000,000		
Total Assets	10,000,000	Total Liabilities	10,000,000

If people trust the bank, borrowers will agree to receive their loans in bills, which will circulate as if they were money. Under these conditions the banker may even believe, with good reason, that no one will ever return these bills to the bank to withdraw the original money deposited. The moment the banker decides this is the case, his judgment may manifest itself as an accounting entry identifying the 9,000,000 false bills put into circulation by the bank as part of the year's profit, which the banker may freely appropriate. The following journal entries will be made:

Bank A

(57) Debit		Credit	
1,000,000	Cash	Banknotes	1,000,000
9,000,000	Loans	Banknotes	9,000,000
9,000,000	Banknotes	Profit	9,000,000

These accounting entries reflect the fact that the banker is sure he will never have to return the sum of the bills, since his bills circulate as money. The bank's balance sheet will look like this:

(58)

Bank A
Balance Sheet

Assets		Liabilities	
Cash	1,000,000	Banknotes	1,000,000
Loans	9,000,000	Profit (equity)	9,000,000
Total Assets	10,000,000	Total Liabilities	10,000,000

From this balance sheet we can conclude that once the banknotes have acquired the nature of monetary units, no one will ever return them to the bank to withdraw the money deposited, since the bills circulate freely and are considered money themselves. Only 1,000,000 of the banknotes issued are recorded in the Liabilities column, because 10 percent is sufficient to comply with ordinary requests for conversion. Hence this balance sheet amounts to an acknowledgment of the fraud the bank commits when it issues bills for an amount exceeding the sum of money deposited. Bankers have never thus recorded in their account books the issuance of unbacked banknotes, as it would fully reveal the fraud they commit. By their deceitful actions they harm third parties, whose money drops in value due to the increase in the money supply, not to mention economic crises and recessions, an effect we will consider later. Nonetheless this last balance sheet is clearly more honest, in the sense that at least it demonstrates the banker's maneuver and the fact that the issuance of unbacked bills constitutes an endless source of financing which permits bankers to appropriate a very large volume of wealth.

The reader will surely have noticed that records (54) through (55) are identical to ones we studied with respect to

deposits. In fact the nature of banknotes is identical to that of secondary deposits and both produce the same economic effects. They actually represent the same operation and result in identical accounting records.

Both activities generate considerable assets for banks, who gradually take this wealth from all economic agents in the market through a process the agents cannot understand or identify, one which leads to small decreases in the purchasing power of the monetary units all use in society. Credit expansion is backed by the creation of new deposits or bills, and since these are considered money in themselves, from the subjective point of view of the public, they will never be withdrawn under normal conditions. In this way banks appropriate a large volume of wealth, which from an accounting standpoint they guarantee with deposits or bills that permit them to disguise the fact that economically speaking they are the only beneficiaries who completely take advantage *de facto* of these assets. Thus they have found a perennial source of financing which will probably not be demanded from them, a "loan" they will never have to return (which is ultimately the same as a "gift"). From an economic point of view, bankers and other related economic agents are the ones who take advantage of these extraordinary circumstances. They possess the enormous power to create money, and they use this power continually to expand their assets, open new offices, hire new employees, etc. Furthermore they have managed to keep their activities relatively hidden from most of the public, including economists, by backing their created loans with liability accounts (deposit accounts or banknote accounts) that do not coincide with their actual equity. In short, bankers have discovered their *Philosopher's Stone* (much like the one sought-after in the Middle Ages), which enables them to create new monetary units from nothing, and thus to generate hidden wealth, harming and deceiving third parties in the process. In account books depositors are formally recognized as the owners of such wealth, but in practice it does not belong to anyone (however, economically speaking, it belongs to the bankers themselves). As we mentioned before, the recognition of this fact is fundamental to our arguments in the last chapter, where we propose a plan for reforming the banking system.

The wealth banks have gradually accumulated can and must be returned to the citizens. Through a process of privatization, it should become available for different uses of great importance to society (for example, to help pay off the national debt, or make a transition to a private Social Security system based on investment).

The parallels between the issuance of unbacked banknotes and credit expansion backed by secondary deposits created *ex nihilo* are now evident. Indeed all of the arguments offered in the preceding pages hold true for banknotes as well as for demand deposits. With that in mind, let us briefly consider a few entries. For example, when loans are granted against the issuance of banknotes:

Bank A

(59) Debit		Credit	
1,000,000	Cash	Banknotes	1,000,000
900,000	Loans	Banknotes	900,000

In this case the bank grants loans from nothing by simply issuing "false" bills and giving them to borrowers. In the worst of cases, if these borrowers return the bills to the bank to withdraw units of commodity money from the vault, the bank's balance sheet will look like this:

(60)

Bank A
Balance Sheet

Assets		Liabilities	
Cash	100,000	Banknotes	1,000,000
Loans	900,000		
Total Assets	1,000,000	Total Liabilities	1,000,000

If we suppose that the borrowers pay this money to other people, who eventually take it to another bank, for instance Bank B, which also issues banknotes without backing, Bank B would make the following journal entries:

Bank B

(61)

Debit		Credit	
900,000	Cash	Banknotes	900,000
810,000	Loans	Banknotes	810,000

Bank B's balance sheet would appear as follows:

(62)

Bank B
Balance Sheet

Assets		Liabilities	
Cash	90,000	Banknotes	900,000
Loans	810,000		
Total Assets	900,000	Total Liabilities	900,000

The process continues in this manner and spreads throughout the system. If we suppose that the reserve ratio, c, for banknotes is equal to 0.1 and $k = 0$, we know the system will be able to create from nothing:

$$[41] \qquad \frac{d(1-c)}{c} = \frac{1{,}000{,}000(0.9)}{0.1} = 9{,}000{,}000$$

monetary units in the form of bills unbacked by original money (gold or any other type of commodity money).

We would have obtained the same result in the case of a monopolistic bank, one that enjoys the trust and business of everyone, with a reserve ratio, c, of *0.1* and a k of 1. In this case the credit expansion, x, would be equal to:

$$[42] \quad x = \frac{d(1-c)}{1+k(c-1)}$$

and when $k = 1$, x equals: $\frac{d(1-c)}{c}$ banknotes created *ex nihilo*.

If we suppose that all the banks issue bills simultaneously and receive new original monetary units at the same rate, then by maintaining its cash reserves unaltered, a single bank will be able to generate banknotes equal to:

$$\frac{d(1-c)}{c}$$

This is the same formula we applied to deposits. The following entries will be made:

Bank A

(63) Debit		Credit	
1,000,000	Cash	Banknotes	1,000,000
9,000,000	Loans and other uses	Unbacked banknotes	9,000,000

We could also reproduce all of the accounting entries for the more general case in which $k > 0$ (in our previous example $k = 0.2$). If $c = 0.1$, then for each 1,000,000 m.u. a bank receives, it will be able to create from nothing new banknotes for a sum equal to:

$$[43] \quad \frac{d(1-c)}{1+k(c-1)}$$

That is, the bank will have the capacity to create 1,097,560 m.u. in the form of unbacked bills. One by one we could duplicate for banknotes all of the results we obtained for bank deposits, which shows that there is no economic difference between the issuance of unbacked bills and the *ex nihilo* expansion of bank-credit backed by deposits generated from nothing. The only substantial difference is of a legal nature, since according to universal legal principles, the issuance of unbacked bills implies counterfeiting and the crime of fraud, while the monetary bank-deposit contract only involves misappropriation.

Nonetheless there are some differences regarding the way the operation is carried out. Banknotes take the form of bearer bonds and each has a particular face value, allowing the notes to be transferred from one person to another without it being necessary for the bank to make any accounting entry in its books (and as a result the cost of bank transactions decreases). In contrast deposits offer customers the advantage of being able to write an exact figure on a check without needing to hand over a specific number of bills of a set value. However the fact that the banker must follow the transactions conducted and record them in his books constitutes a disadvantage.

Still, apart from these legal differences and differences in form, from an economic standpoint the two operations are essentially identical and produce the same effects. As we will see later, however, when the theory of money was first being developed, theorists only recognized the immorality of the creation of unbacked banknotes and the serious harm it causes. They did not initially realize nor respond to the fact that the expansive creation of loans backed by deposits generated from nothing has exactly the same effects. This explains why the Peel Act of July 19, 1844, the foundation of all modern banking systems, prohibited the issuance of unbacked bills yet failed miserably to achieve its objectives of monetary stability and an adequate definition and defense of citizens' property rights with respect to banking. Its failure was due to legislators' inability to comprehend that bank deposits with a fractional reserve have exactly the same nature and economic effects as unbacked banknotes. As a result, the Act did not out-

law fractional-reserve banking and allowed the age-old practice of "issuing" unbacked (secondary) deposits to continue. In reality secondary deposits predated the fiduciary issue of banknotes, but because the former proved much more complex, only the latter was (very belatedly) prohibited. The monetary bank-deposit contract with a fractional reserve is still legal today, even though it has exactly the same economic nature and produces the same damaging effects as the issuance of unbacked banknotes prohibited in 1844 by the Peel Act.[41]

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[41]As chapter 8 will reveal in greater detail (pp. 624 ff. and 644 ff.), the first theorist to realize that bank deposits are money and that fractional-reserve banking increases the money supply was the Spanish scholastic Luis de Molina, *Tratado sobre los cambios*, edited and prefaced by Francisco Gómez Camacho (Madrid: Instituto de Estudios Fiscales, 1991; first edition was published in Cuenca in 1597). See esp. *Disputation* 409, pp. 145–56, esp. p. 147. Nevertheless, Luis de Molina did not observe the parallels between secondary deposits and unbacked bills, since in his time banks had still not begun to exploit the possibility of issuing banknotes. It would not be until 1797 that Henry Thornton would for the first time refer to the equivalence of bills and deposits (see his Response of March 30, 1797 in "Evidence given before the Lords' Committee of Secrecy appointed to inquire into the courses which produced the Order of Council of the 27th February 1797," reproduced in *An Inquiry into the Nature and Effects of the Paper Credit of Great Britain*, F. A. Hayek, ed. (Fairfield, N.J.: Augustus M. Kelley, 1978), p. 303. Several years later the same conclusion was reached by Walter Boyd, James Pennington, and the Pennsylvania senator Condy Raguet, who believed that deposits and banknotes both constituted part of the money supply and that any bank which failed to immediately and on demand pay the value of banknotes issued by it should lose its license to operate, as should any bank which failed to immediately and in cash honor requests for withdrawals of deposits the bank had issued [see the "Report on Bank Charters" by Condy Raguet, included in the *Journal of the Senate, 1820–1921*, Pennsylvania Legislature, pp. 252–68 and Murray N. Rothbard's related comments included in his book, *The Panic of 1819: Reactions and Policies* (New York and London: Columbia University Press, 1962), p. 148]. Quite significantly, banking school theorists themselves were the first to rightly insist that it was very paradoxical to try to limit the issuance of unbacked bills while not advocating the same measure regarding deposits, given that bills and deposits had exactly the same economic nature. See, for example, James Wilson's book, *Capital, Currency and Banking* (London: *The Economist,* 1847), p. 282; see also Vera C. Smith's comments in her

8
THE CREDIT TIGHTENING PROCESS

One of the central problems posed by the process of credit expansion and *ex nihilo* deposit creation, and thus by the bank deposit contract involving a fractional reserve, is that just as this process inevitably unleashes forces that *reverse* the effects of credit expansion on the real economy, it also looses forces which lead to a parallel process of *credit tightening or contraction. Ceteris paribus*, any of the following

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book, *The Rationale of Central Banking and the Free Banking Alternative*, p. 89. Smith makes a most perceptive observation when referring to Wilson and to the grave error of the currency school, which was incapable of recognizing the economic parallels between bills and deposits, she states:

> The reason the currency school usually gave for this distinction was that bank notes increased the circulation and deposits did not. Such an argument was not, of course, acceptable to Wilson as a member of the banking school of thought which both denied that the issue of notes could be increased to any undesirable extent so long as convertibility was strictly maintained, and pointed out that the difference claimed between notes and deposit liabilities was invalid. But it was still denied in many quarters that demand deposits formed part of the circulation, and it was probably by no means generally admitted right up to the time of MacLeod. (p. 89)

Wilson was completely justified in pointing out this contradiction; given the economic equivalence of banknotes and deposits, the arguments in favor of regulating the issuance of one unbacked form are directly applicable, *mutatis mutandis*, to the other. Moreover this is the same inconsistency manifested nearly a century later by defenders of the contract of irregular deposit of securities in which the bank is allowed to make use of deposits. This controversy arose at the beginning of the twentieth century with respect to banking practices in Barcelona, and at that time the use of a fractional reserve in connection with irregular deposits of securities was called into question and harshly condemned. As defenders of this contract correctly argued at the time, the reasons put forward against this practice should also be applied to monetary bank deposits with a fractional reserve (see related observations in chapter 3).

events serve to establish that such a process has been set in motion: (a) a decrease in original deposits; (b) an increase in the desire of the public to hold monetary units outside the banking system (i.e., an increase in *f*); (c) a rise in banks' "prudence," leading them to boost their reserve ratio, *c*, in order to be able to comply with the higher average number of possible withdrawal requests; (d) a sudden rise in loan repayment not offset by an increase in loans granted; and (e) an escalation in the number of borrowers unable to return their loans, i.e., many more defaulters.

First, it is clear that if a certain sum in original deposits is withdrawn from a bank (for instance, the 1,000,000 m.u. deposited in past illustrations), all created loans and deposits such as we referred to in preceding examples would disappear in a chain reaction, resulting in fewer loans and deposits. If we suppose that $c = 0.1$ and $k = f = 0$, then the decrease in loans and deposits would equal 9,000,000 m.u., implying a significant *drop in the money supply*, which would fall to one-tenth of its prior sum. The result is severe *deflation*, or a decline in the amount of money in circulation, leading to a reduction in the prices of goods and services, which, in the short and medium term, further aggravates the recession ultimately caused in the market by all processes of credit expansion.

Second, a desire of the public to keep more money outside the banking system produces the same effects. It provokes an increase in *f* and a decline in banks' capacity for credit expansion, which in turn brings about a recession and a monetary squeeze.

Third, a decision by banks to be more "prudent" and to increase their reserve ratio leads to a contraction as well.

Fourth, the repayment of loans produces equally deflationary effects (when enough new loans are not granted to at least offset the ones returned). Let us consider this possibility in greater detail. We will begin by imagining a bank with $c = 0.1$, $k = 0$ and $f = 0$, whose borrowers pay back their loans. The accounting entries and balance sheet prepared when the loans are granted are as follows:

Bank A

(64)	Debit	Credit	
1,000,000	Cash	Demand deposits	1,000,000
900,000	Loans	Demand deposits	900,000
900,000	Demand deposits	Cash	900,000

(65)

Bank A
Balance Sheet
c=0.1, k=0 and *f=0*

Assets		Liabilities	
Cash	100,000	Demand deposits	1,000,000
Loans	900,000		
Total Assets	1,000,000	Total Liabilities	1,000,000

In previous examples we observed the creation through the banking system of new loans and deposits for the sum of 9,000,000 m.u. In this instance, when borrowers return the loans the last two accounting entries are canceled as follows:

Bank A

(66)	Debit	Credit	
900,000	Cash	Demand deposits	900,000
900,000	Demand deposits	Loans	900,000

The balance sheet of Bank A now looks like this:

(67)

Bank A
Balance Sheet
c=0.1, k=0 and *f=0*

Assets		Liabilities	
Cash	1,000,000	Demand deposits	1,000,000
Total Assets	1,000,000	Total Liabilities	1,000,000

Economically speaking, this means that from the point of view of an individual bank, there has been a 900,000 m.u. decrease in the money supply, which has gone from 1,900,000 m.u. at the time the loans were given (1,000,000 in deposits and 900,000 in money handed over to the borrowers) to 1,000,000 m.u., the only money left once the loans are repaid. Therefore from the standpoint of an isolated bank the money supply clearly contracts.

Given that all banks expand credit and receive original deposits simultaneously, we already know each bank is able to maintain its cash reserves constant and grant loans for a multiple of its reserves. Hence the balance sheet of any bank, Bank A for instance, would appear as follows:

(68)

Bank A
Balance Sheet
c=0.1, k=0 and *f=0*

Assets		Liabilities	
Cash	1,000,000	Demand deposits	10,000,000
Loans	9,000,000		
Total Assets	10,000,000	Total Liabilities	10,000,000

If all the bank's borrowers return their loans paying with checks, the bank's balance sheet will look like this:

(69)

Bank A
Balance Sheet
c=0.1, k=0 and *f=0*

Assets		Liabilities	
Cash	1,000,000	Demand deposits	1,000,000
Total Assets	1,000,000	Total Liabilities	1,000,000

This balance sheet clearly reflects the 9,000,000 m.u. reduction in the money supply or tightening of credit. An identical decline would result from the simultaneous repayment of loans in isolated banks, as in entries (66) and (67), through a process identical to the inverse of the one shown in Table IV-2.

Fifth, if the loans lose their value due to the failure of the economic activity for which they were employed, the corresponding bank must record this fact as a loss, as shown here:

Bank A

(70) Debit		Credit	
9,000,000	Losses due to defaulters (expenses)	Loans	9,000,000

The bank's balance sheet would then look like this:

(71)

Bank A
Balance Sheet
c=0.1, k=0 and *f=0*

Assets		Liabilities	
Cash	1,000,000	Deposits	10,000,000
Losses for the year	9,000,000		
Total Assets	10,000,000	Total Liabilities	10,000,000

If we compare this balance sheet with (69), we see the bank holds the same amount in cash reserves in each instance, yet a very significant difference exists: in (71) the Liabilities column reflects 10,000,000 m.u. in deposits, as opposed to 1,000,000 m.u. in (69). In other words, *the bank has technically failed*. Nevertheless as long as depositors continue to trust it, no decrease in the money supply will take place. In fact, since no one will claim the 9,000,000 m.u. of secondary deposits the bankers created from nothing, they may even consider this amount part of the year's profits, a sum to compensate for the 9,000,000 m.u. lost to defaulters, leaving the balance sheet as it appears in (69).[42] However in terms of deflation this situation is obviously even more dangerous than that following the repayment of a loan: before arriving at this situation, banks will heavily restrict new loans (they will be much more rigorous in their criteria for granting them), accelerating the deflationary process; and if the measures they take do not prove sufficient to avoid defaulters and the risk of failure, they will

[42]It is interesting to note how bankers involved in crises invariably complain that with just a little assistance from someone (the state or the central bank) in restoring their customers' confidence, they could continue to function with no problem and quickly reestablish their "solvency."

be one step away from losing the confidence of their depositors, who may force them to suspend payments and/or declare bankruptcy, and in this case even the 1,000,000 m.u. originally deposited in cash would be withdrawn, threatening the existence of the entire banking system.

Under *ordinary conditions* the contraction or deflation we are describing does not occur, because when a customer of one bank returns a loan, the sum is compensated for by another loan granted by another bank; in fact even within the same bank the attempt is always made to replace the repaid loan with a new one. In addition under normal circumstances the bank may consider payment arrears just one more operating cost. The crucial problem posed by credit tightening (as we will examine in the following chapters) consists of the fact that the very process of credit expansion based on a fractional reserve inevitably triggers the granting of loans unsupported by voluntary saving, resulting in a process of intertemporal discoordination, which in turn stems from the distorted information the banking system imparts to businessmen who receive loans generated *ex nihilo* by the system. Hence businessmen rush out to launch investment projects *as if society's real saving had increased, when in fact this has not happened. The result is artificial economic expansion or a "boom," which by processes we will later study in detail, inevitably provokes an adjustment in the form of a crisis and economic recession*. This sums up the negative effects exerted on the real economy by the financial practice of expanding credit through the issuance of fiduciary media (deposits).

The crisis and economic recession reveal that a highly significant number of investment projects financed under new loans created by banks *are not profitable* because they do not correspond to the true desires of consumers. Therefore many investment processes fail, which ultimately has a profound effect on the banking system. The harmful consequences are evidenced by *a widespread repayment of loans* by many demoralized businessmen assessing their losses and liquidating unsound investment projects (thus provoking deflation and the tightening of credit); they are also demonstrated by an alarming and atypical rise in payment arrears on loans

(adversely affecting the banks' solvency). Just as the money supply was expanded according to the bank multiplier, artificial economic expansion fostered by the *ex nihilo* creation of loans eventually triggers an endogenous recession, which in the form of a widespread repayment of loans and an increase in arrears, reduces the money supply substantially. Therefore *the fractional-reserve banking system generates an extremely elastic money supply, which "stretches" with ease but then must contract just as effortlessly, producing the corresponding effects on economic activity, which is repeatedly buffeted by successive stages of boom and recession.* "Manic-depressive" economic activity, with all of its heavy, painful social costs, is undoubtedly the most severe, damaging effect the current banking system (based on a fractional reserve, in violation of universal legal principles) has on society.

In short, bank customers' economic difficulties, one of the inevitable consequences of all credit expansion, render many loans irrecoverable, accelerating even more the credit tightening process (the inverse of the expansion process). In fact, as in our accounting example, the bank may completely fail as a result, in which case the bills and deposits issued by it (which we know are economically equivalent) *will lose all value*, further aggravating the monetary squeeze (instead of the 9,000,000 m.u. decrease in the money supply caused by the return of a loan, here the money supply would drop by 10,000,000 m.u.; that is, including the 1,000,000 m.u. in primary deposits held by the bank). Furthermore, one bank's solvency problems are enough to sow panic among the customers of all other banks, leading them to suspend payments one by one, with tragic economic and financial consequences.

Moreover we must point out that, even if the public continues to trust banks (despite their insolvency), and even if a central bank created *ad hoc* for such situations provides all the liquidity necessary to assure depositors their deposits are fully protected, the inability to recover loans initiates a process of credit tightening that is spontaneously set off when loans are repaid and cannot be replaced by new ones at the same rate. This phenomenon is typical of periods of recession. When customers default on their loans, banks become more

cautious about granting more. Hence the natural reluctance of the demoralized public to request loans is reinforced by banks' greater prudence and rigor when it comes to giving them. In addition, as bankers see their profitability fall along with the value of their assets as a result of irrecoverable loans, they will attempt to be more careful, and other things being equal, to increase their cash on hand by raising their reserve ratio, which will have an even greater tightening effect. Finally business failures and frustration arising from the inability to honor commitments to banks will contribute even more to the *demoralization* of economic agents and to their determination to avoid new investment projects financed with bank loans. In fact many businessmen eventually realize they allowed themselves to be carried away by unjustified optimism in the phases of expansion, *largely due to the excessively generous credit terms bankers initially offered*, and the businessmen correctly attribute their errors in judgment to these easy terms.[43] As a result they resolve not to commit the same errors again. (Whether or not their attempt at rectification is successful and in the future the businessmen remember their unpleasant experiences during the stage of recession is a different issue we will confront later.)

In conclusion, we have seen that the fractional-reserve banking system can contract and drastically reduce the money supply just as easily as it expands credit and increases the money supply. In other words, the system generates an elastic and extremely fragile stock of money which is subject to great

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[43]See also chapter 5, no. 4. The serious harm bankers do those customers they urge to "enjoy" new loans and get involved in business deals requiring bank financing should theoretically be admitted in legal cases in which banks would be sued for damages with respect to the injury they inflict upon borrowers in this way. If until now such suits have not been brought before the court, it is because economic theory had not been advanced enough to clearly identify the cause and nature of the injury. However nowadays theoretical developments make it possible to apply theory in court. A very similar, parallel case would be the use of breakthroughs in biology to facilitate judicial declarations of paternity which were impossible a few years ago.

convulsions that are very difficult, if not impossible, to mitigate or stop. This monetary and banking system contrasts with inelastic systems (for example, the one that combines the classic gold standard with a 100-percent reserve requirement), which do not permit disproportionate expansion of the money supply (the worldwide production of gold has been growing in recent centuries at the rate of 1 to 2 percent per year). Moreover they offer the following advantage: due to the fact that these systems are inelastic (gold is indestructible and throughout history the world has accumulated a very inflexible stock of it), they do not permit any abrupt decline, nor (logically) any credit or monetary squeezes which exert debilitating effects on the economy, as opposed to the current situation for which the existing banking system is responsible.[44]

[44]In the last chapter we will examine the comparative advantages of the classic gold standard based on a banking system subject to legal principles; that is, with a 100-percent reserve requirement.